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**AN INVESTIGATION OF  
FACTORS INFLUENCING  
ADOLESCENT HEALTH BEHAVIOUR**

Presented by

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for the Degree of Master of Philosophy

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March 1986

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March 1986

**AN INVESTIGATION OF FACTORS INFLUENCING ADOLESCENT  
HEALTH BEHAVIOUR**

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Laura A. Lindsay-Clift  
Open University



**ABSTRACT**

In this study, the Ajzen and Fishbein model, developed from their theory of reasoned action, was applied to the investigation of factors influencing adolescent health behaviour. This model proposes that intentions (by extension, behaviour) are explained by a weighted combination of evaluated beliefs about that behaviour (i.e. attitudes) and motivation to comply with the wishes of significant referents concerning that behaviour (i.e. perceived social pressures).

Recent innovations in Health Education in schools seem implicitly to be based on this rationale. They seek to establish beliefs leading to good health behaviour and to develop in pupils the confidence to act in accordance with these beliefs in the face of possible contrary social pressures.

Questionnaires for measuring adolescents' intentions, beliefs and perceptions of social pressures concerning drinking alcohol, smoking cigarettes, keeping fit and diet were developed through a series of pilot trials, adapting the approaches suggested by Ajzen and Fishbein and subsequent workers. The reliability of these measures was shown to be satisfactory. Face and content validity were ensured during development: convergent and discriminant validity were evident, post hoc. The criterion-related validities of the scales were established, demonstrating the internal and external validity of the model itself.

## Abstract

A representative sample of pupils aged 11 to 18 years, from Berkshire secondary schools, completed these questionnaires. The amount of variance in intentions explained by the weighted combination of the variance in beliefs and social pressures was statistically significant for all the topics and similar in magnitude to that frequently reported in attitude-behaviour studies with adolescents. It was lower, however, than that reported by researchers using the Ajzen and Fishbein model with adults. Reasons for this short-fall are considered: the unsuitability of the model for use with adolescents; the incorporation of constant and random error in the data; and the use of short scales.

Finally, the implications of the results for Health Education programmes are considered.

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## BEHAVIOUR AND HEALTH EDUCATION

There is a popular assumption that aspects of the behaviour and life-style of many young people are detrimental to their present and future health. A substantial body of published research (reviewed below) confirms this assumption. The present study is confined to the investigation of factors influencing drinking alcohol, smoking tobacco, physical fitness and diet, in adolescence: that is areas of preventative medicine, avoiding sensitive issues such as personal hygiene, illicit drugs and sexual behaviour.

In order to put the study into context, in this first chapter, recent research into adolescent behaviour in relation to these four topics is briefly reviewed. This is followed by an over-view of recent innovations in the school Health Education curriculum. The psychological rationale underlying these innovations is then considered, leading to a statement of the research hypotheses to be tested and the presentation of the model to be used in the investigation.

### **Adolescent health behaviour**

#### ***Drinking Alcohol***

There has been no national survey specifically concerned with young people's drinking habits. Included in 'Young People in the 80's, a Survey' (DES 1983, pp.18-19), however, is a section on 'The adolescents and their world', which contains some information on this topic. This information is based upon a survey which was carried out on 14 to 19 year olds, three in five of whom were still in school. It indicates that, of the young people aged between 14 and 17

years, 8% drink regularly and 57% occasionally: of those over 17 years, 33% drink regularly and 52% occasionally. This demonstrates an increase in drinking with age: only 15% of older adolescents are non drinkers. Drinking occurs both outside and within the home. Both positive and negative effects of alcohol were recognised by the survey participants, and the attitude overall to alcohol consumption was distinctly ambivalent. Quantitatively, the negative implications of alcohol consumption outweigh the perceived advantages. The possibility of fights, trouble with the police and unwanted pregnancy ensuing from potential loss of control were the main concerns and worries about drinking. On the other hand, drinking was also seen as a way of conforming to expected social behaviour and as likely to increase confidence and lessen worries.

Using data from his Health Related Behaviour Questionnaire, Balding (1985a) has reported on the 'alcohol-related behaviour' of 18,000 pupils in the first to fifth years of secondary schools throughout the country. In response to the question:

'On how many days last week did you drink alcohol?'

Balding reports:

1. Even at age 11, over half the boys and a third of the girls had an alcoholic drink on at least one day in the last week.
2. The percentage of [such] "drinkers" increases from 56.5% to 71.8% for boys and from 35.4% to 62.1% for girls, from the first to fifth years in this cross-sectional sample.'

He also reports that the frequency of drinking appears to increase with age. In reply to the question:



'If you drank alcohol last week, where did you get it from?'

'home' consistently showed up as the largest percentage across the whole age group (approximately 35% of pupils had obtained alcohol from home in the previous week). By the fifth year, however, 'home' was being very strongly challenged by the public house, regardless of the fact that young people of this age (15 to 16 years) are legally not permitted to consume alcohol on licensed premises!

In summary, many young people appear to be drinking alcohol regularly, the frequency hence probably the quantity consumed, increasing with age. It may be assumed that this is with parental knowledge and tacit consent.

### ***Smoking tobacco***

There have been two major national surveys of the smoking habits of British secondary school children: Bynner's (1969) study of smoking amongst boys and Dobbs and Marsh's (1983) study of both boys and girls. In addition, there have been several recent large-scale local surveys of young people's smoking behaviour, e.g. Rawbone's (1982) study in Hounslow, London; Wilcox and Gillies' (1984) Sheffield study; Nelson's et al (1985) study in Avon (HEC Smoking Education for Teenagers Project).

Regarding adult smoking behaviour, figures from the General Household Survey for 1980 (Thomas 1982) show that 42% of males and 37% of females over the age of 16 are regular smokers. This is borne out by Marsh and Matheson (1983) who say, '... according to our definition of a smoker, only 39% of a general survey of the adult population aged 16 to 66

would be defined as a smoker'. Dobbs and Marsh (1983 op cit, p.8) report that only 1% of 11 to 12 year olds smoke regularly (one or more cigarettes per week), but this rises to 27% of 15 to 16 year olds. A comparison of Dobbs and Marsh's data with that of Bynner (op cit) suggests that a substantial long term fall in boys' smoking may have occurred. For example, Dobbs and Marsh reported that only 19% of fourth year boys (14 to 15 years) smoked regularly compared with the 34% reported by Bynner. This improvement in boys' health behaviour, however, has coincided with an increase in smoking amongst girls since 1966. Bynner reported (p.17) girl smokers to be so uncommon that they did not warrant further investigation. Seventeen years later, in Dobbs and Marsh's survey (p.9), 15% of fourth year girls are reported already to be regular smokers. This is in accordance with the findings of Rawbone, who reported a decline in smoking amongst boys and a corresponding increase amongst girls.

A more recent local survey amongst over ten thousand 11 to 16 year olds from ten schools in Avon (Nelson et al, op cit) indicates an even higher prevalence of smoking amongst adolescents than the Dobbs and Marsh survey. Applying the Dobbs and Marsh definition of regular smoking (one or more cigarettes per week), a sharp escalation with age is reported, from 3% of 11 years olds to 33% of 16 year olds. Smoking six or more cigarettes per week, the escalation was similar: from 1% of 11 year olds to 27% of 16 year olds. This Avon study included an interesting attempt to tease out, in order of importance, those attitudinal and normative factors which predict a pupil's smoking status. A

step-wise discriminant analysis was carried out which indicated that the strongest predictor of 'smoker status' is the belief that smoking is enjoyable. This is closely followed by the teenager's expectations of whether parents and friends would mind if they smoked. One of the most striking features of this analysis is the weak relationship which exists between a person's beliefs about the health hazards of smoking and his or her smoker status.

### ***Physical Fitness***

There have been no major national surveys investigating the extent of the participation of adolescents in physical activities or measuring their physical fitness.

The following statement about exercise is made in the report of the National Advisory Committee on Nutrition Education (NACNE 1983):

'A substantial increase in exercise patterns of the whole community is needed ...' (p.12)

The survey on Young People in the 80's (DES 1983 op cit p.34) contains a section on 'Sporting Activities' (although included in these activities are pool and darts which are not likely to affect physical fitness). Nearly two thirds (64%) claim to take part regularly in sporting activities: there is a strong male bias (75% boys, 53% girls). Significantly more younger adolescents play sport regularly (70%) than do older adolescents (57%), indicating a fall-off in activity after leaving school, where Physical Education is compulsory. Nearly two in five adolescents expressed a desire for greater participation in sports. The reasons given most frequently for not taking part in some

sports are lack of facilities and lack of money.

Working in Scotland, Inglis et al (1984) conducted a programme of individual health counselling which included fitness tests, e.g. muscle endurance, grip strength, flexibility, lung function and general endurance. Data were collected from 1300 individuals aged 16 years and above. Most participants in their 'community sample' were in their teens or early twenties, in their 'work sample' the participants were older. There are no physical fitness norms available for such a population in Scotland or other parts of the UK, so Inglis et al carried out evaluations using comparative data from other European industrial populations and the USA. They found that their participants showed:

- inferior lung function;

- lower values for grip strength;

- less ability to flex the hip joint and the vertebral column;

- an inferior oxygen transport system.

It would appear that, compared with people in other parts of the developed world, this sample is less fit and that, after leaving school, a major challenge is to find forms of useful exercise that can be incorporated into daily life and take account of cost and availability.

### **Diet**

There have been no major national surveys specifically investigating adolescent eating habits. Evidence of a partial or local nature is therefore offered.

A survey, presented in a 'World in Action' programme

(ITV: Countdown to a Coronary. 13.2.84), indicated that most children eat high fat food at lunch time, many eat fish or sausage and chips or hamburgers. On analysis, a portion of fish and chips, bought in Scotland by the programme, was found to have a fat content of 83% (Parahoo 1984): a 'lethal' sausage with 72% fat content was located in Edinburgh (Hackett 1984). Professor Rose, of the World Health Organisation (WHO) Committee on Heart Disease, speaking on the same programme about the consequences of this eating behaviour, related a high fat diet to 'furring' of arteries, hence heart attacks in later life. He said that evidence of such furring began to show at the age of about 10 years. By the late teens and early twenties, serious trouble really started (Hackett, op cit). In the same programme, it was said that evidence of early arterial furring had been obtained in Vietnam where half the young Americans killed had been found to have badly furred arteries. Thus the proportion of fat in British school children's diet was shown to be high, and it was also demonstrated that arterial sclerosis ('furring') starts in childhood.

McGuffin (1983) reports on major surveys of the eating habits of adolescents carried out in three parts of the British Isles: McSweeney and Kevany (1981), National Dairy Council (1982) and McGuffin (1979). McGuffin's general conclusions from these surveys are that most young people are adequately fed but that their eating habits are erratic; that they should eat more fresh fruit, green vegetables and whole grain food and less fried food. The eating of sweets and snacks is criticized by McSweeney and Kevany and by

McGuffin, because of the carcinogenic nature of much of that type of food and also because of the possibility of obesity, if the habit is perpetuated. They suggest that school tuck shops should provide attractive nutritious alternatives to sweets and soft drinks, such as fruit, savoury biscuits and nuts.

Parahoo (op cit) reports that an 'informal survey' conducted by the South Wales Echo in a selection of secondary schools found that 'pastry and chips were tops at school'. The rest of the 'top ten choices' were: 'baked beans, cakes, sausage rolls, biscuits, cola, hot dogs, pizza and beefburger baps, a line up generally low on nutrients and fibre and high on fat'.

The National Advisory Committee on Nutrition Education (NACNE) was constituted in 1979 to research and advise on national diet. Its report, prepared by a sub-committee led by Professor Philip James, was eventually published in 1983. It concludes that the population in general consumes:

- too much fat, particularly animal fat;

- double the nutritionally desirable amount of sugar;

- more than double the amount of salt recommended by the WHO;

- too little fibre, e.g. whole grain, fruit and vegetables;

This reflects the findings of the surveys of adolescents' eating behaviour reported above.

***The Balding Questionnaire***

John Balding and his team at the HEC Schools Health Unit at Exeter University have developed a questionnaire seeking comprehensive information about the health behaviour of secondary school pupils. The Unit provides schools, on request, with a master copy of the questionnaire for duplication, and instructions for its administration. It also processes the completed questionnaires and schools are provided with a printout of the results. The intention is that individual schools can then use the resulting information to plan realistic and relevant Health Education programmes. Balding (1985b) reports that since 1980, approximately 44,000 pupils have completed the questionnaire in some 250 schools distributed throughout the UK. In addition to this service to schools, a by-product is the accumulation of a data bank of health related behaviours of pupils between the age of 11 and 16+. Analyses of the total data bank have not yet been published, although findings on specific topics have been reported, e.g. alcohol related behaviour (Balding 1985a); some dental health-related behaviour findings (Balding 1984). At some time in the future, this data bank should provide invaluable information concerning many facets of adolescents' health behaviour, including smoking, diet, physical activity and further information about drinking alcohol.

***Summary of adolescents' health behaviour***

This brief review of adolescents' health behaviour indicates that:

many young adolescents and most of the older ones consume alcoholic drinks, with the tacit approval of their parents;

there is an increase in smoking with age and a substantial proportion of older adolescents smoke cigarettes;

young people's involvement in physical activities decreases after they leave school and there is some evidence that their fitness also deteriorates;

the eating habits of young people tend to be inconsistent and their diet generally contains too much fat, sugar, and salt and too little fibre.

This emphasises the need for Health Education courses in these areas.

### **Developments in the school curriculum in Health Education**

Health Education has for many years been held in uncertain regard in schools in England and Wales. The sponsorship, over the last decade, of a number of curriculum development projects by the Schools Council (SC) and the Health Education Council (HEC) is a recognition that the largely ad hoc and uncoordinated work of teachers in this field needed to be given much more form and emphasis.

In a recent article in the Times Educational Supplement (TES), Gibson (1984) reports that the earlier of these projects, such as Schools Health Education Project 5-13, 'All about me 5-8' and 'Think Well 9-13' (SC 1977), 'Home and Family 8-13: Home Economics in the Middle Years' (SC 1979), and 'My Body 10-12' (HEC 1983), have served to develop much interest in school Health Education programmes. But despite the acknowledged excellence of these projects, he suggests it has long been recognised that on their own they are not likely to bring about long-term curriculum change. This is more likely to come about, he claims, if schools develop more flexible, problem-solving approaches



centred on the school and are provided with additional teacher-support facilities. Neeson (1984), also writing in the TES about the more recent projects, reports that over the past five years, Health Educators have attempted to shift the emphasis away from Human Biology towards the development in young people of personal and social awareness and to this end teachers have been encouraged to develop competence in less didactic methods of teaching, such as small group discussion and role play.

In fact some of the most recent projects have included teacher in-service (INSET) support networks along with a more informal methodology for teaching decision-making skills concerning personal choices. The following examples are offered as illustrations.

The HEC-sponsored Active Tutorial Work (ATW) and Schools Health Education Programme (SHEP) 13 to 18 courses for co-ordinators both set out to link curriculum development to some form of teacher in-service education. Individual teachers were encouraged to think creatively, taking the projects' ideas and developing them further for themselves, critically examining their roles in school and the ways in which Health Education might better be developed alongside and within other curriculum areas.

The aims of ATW were to develop in pupils social skills, skills of listening, conversation and step-by-step discussion and the ability to cope with relationships and feelings. The INSET objectives of ATW were to familiarise teachers with informal, non-didactic teaching methods. The

form which the in-service training took therefore was that of 'workshops', in which the teachers took part in the same sort of group activities as were later intended for the pupils. There was continued support from the project for teachers who were training their colleagues in school. Materials with accompanying guidelines were also made available.

The purpose of the SHEP 13-18 INSET was to help teachers, who would later be Health Education Co-ordinators in their own schools, to *organise* the teaching of Health Education. The following topics were therefore included:

1. reviewing the current Health Education curriculum in school;
2. choosing and building a team and conducting team meetings;
3. planning and implementing new Health Education courses.

The Co-ordinators Guide (SC/HEC 1980) was used with these teachers during in-service courses, which were characterised by a high degree of participation, e.g. 'buzz sessions', simulations, brain storming, small group discussions and role play (Health Education 13-18 Co-ordinators Guide pp. 53-54). Initially there were no teaching materials accompanying this project, but exemplar materials were published later in a pack entitled Health Education 13-18 (SC/HEC 1982).

The Education for Family Life project (OU/HEC 1985), is designed to help teachers in the fields of personal and social education. Of it, the authors, Eisenstadt and Braun (1984) say:

"... the overall aim of the project is to support teachers in adapting group work methods to classroom work on themes concerned in the broadest sense with family life. ... the project has a strong commitment to experiential learning - that is learning based on the knowledge and experience the learner brings to the subject area. ... By allowing pupils to make decisions about what they would like to learn, and why, one is teaching decision making skills in a way that is purposeful and real. ... we held training days for group leaders from l.e.a.s. all over the country, who then set up their own inservice courses ... "

Other recent Health Education projects employing similar strategies of INSET and non-didactic teaching methods include:

Lifeskills Teaching Programmes 1 and 2 (Hopson and Scally 1979 and 1982);

Smoking and Me (HEC 1984a);

Fit for Life (SC/HEC 1983);

Natural Nashers (HEC 1982);

Smoking or Health - it's your choice (HEC 1984b).

In addition to these projects sponsored by HEC and SC, the Teachers' Advisory Council on Alcohol and Drugs Education (TACADE), have developed teaching packs about alcohol and drugs, again utilising informal teaching methods. They are entitled:

Free to Choose. An approach to drug education. (TACADE 1981);

Alcohol Education Syllabus 11-19 (TACADE/HEC 1984).

TACADE offers training to teachers through their LEA's. In-service courses are normally also in 'workshop' style, using participatory methods.

As well as providing ideas and materials for teachers' use, these projects have prompted teachers to have a fresh look

at what they offer their pupils in Health Education and to develop courses within their own schools.

### **Current aims of Health Education courses in secondary schools**

A review of the aims of some of the more recent projects provides a rapid and clear insight into current perceptions of the nature and purpose of Health Education in secondary schools.

The authors of the Review Section of the Co-ordinators Guide to the Health Education 13 to 18 SHEP Project (SC 1980) say (p.27):

'...Health Education in schools and colleges concerns itself particularly with:

- Giving young people a basic health knowledge and understanding of human development;
- Helping young people to adapt to change in themselves and in their environment;
- Helping young people to explore and understand the feelings, attitudes and values of themselves and others;
- Helping young people to determine where they have control over their health and where they can by conscious choices determine their future health lifestyles.'

Lifeskills Teaching Programmes 1 and 2 (Hopson and Scally op cit) resulted from the Life Skills and Health Education in Secondary Schools project. Anderson (1984), reporting on this project in the TES, suggests that:

'Health Education should be about enabling people to make their own health choices from the information they receive ... Lifeskills education promotes "self empowerment", the idea that each individual has alternatives, can make choices and can develop skills to implement them ... '

Eisenstadt and Braun (1984), in the Introduction to 'Lifestyles', the first teaching pack produced by the 'Education for Family Life' project, state that:

'The purpose of the Lifestyles approach is to help young people to make realistic choices, and to clarify their own needs and wishes about personal relationships and families.'

In the Introduction to 'Free to Choose - An approach to drug education' (TACADE 1981) the following statement is made:

'The hope is simple but profound; that individuals, by exercising greater freedom, and making informed choices, can enjoy the benefits of better health.'

Of the 'Alcohol Education Syllabus 11-19' (TACADE/HEC op cit), the authors state that the materials are designed to:

'... explore strategies that will help them (pupils) to remain in control of their drinking behaviour, to choose how, or if, they will use alcohol. Examples of such themes are the role of self-image in shaping behaviour, the influence and support of peer groups, the importance of being able to be assertive, of thinking positively about yourself, and of knowing alternative ways of coping with life's pressures, ...'

In the introduction to the pilot version of 'Smoking and Me - A Teachers' Guide (HEC 1984), the programme is described as focusing attention on:

- '- the social consequences of smoking.
- peer, family and media influences encouraging smoking.
- ... skills to resist smoking.'

Finally, Baldwin and Wells (1981), in the introductions to Active Tutorial Work, Books 1 to 5 state:

'... this tutorial programme ... is concerned with assisting a young person with his own normal growth and development, with developing his social competence and with weathering the passing "storms" of growing up to become increasingly the master of his own destiny.'

To summarise, paramount in these programmes is an emphasis on choice: '... by conscious choices determine their future health life-styles'; '... to make their own health choices from the information they receive'; '... to make realistic choices ...'; '... making informed choices ...'; '... to choose how or if they will use alcohol'; '... to become increasingly the master of his own destiny'. Choice is seen to be grounded in knowledge and in the ability to resist social pressures towards behaviour which threatens present and future health. So all the projects have an underlying rationale which deals with beliefs and social pressures. Beliefs are approached through an input of knowledge about the link between certain behaviours and health. This is allied to strategies for bolstering young people's self confidence and self-esteem, thus helping them to act according to their modified beliefs in the face of the pressures they may experience from the media, peers and parents, to behave in ways detrimental to their health.

### **The psychological appropriateness of these courses**

The question of the appropriateness of the approaches embodied in these projects arises. They are based upon the assumption that *beliefs* and *social pressures* are the prime determinants of adolescent health behaviour, and that strategies designed to modify these beliefs and perceptions of social pressures will bring about changes in health behaviour.

The purpose of this present study is to test these assumptions by producing valid and reliable instruments for

measuring adolescents' *beliefs*, perceptions of *social pressures* and *health intentions* and to use the instruments to investigate the relative influence of beliefs and social pressures on intentions (hence health behaviour). This will establish whether there is empirical evidence to support the approaches adopted in current health education teaching. Such scales might subsequently be used in the evaluation of the outcomes of Health Education programmes in schools.

### Hypotheses

The hypotheses to be tested are therefore:

1. that a statistically significant amount of the variance in intentions of adolescents, concerning aspects of health behaviour, is explained by a weighted combination of the variance in their beliefs and the social pressures they experience concerning such behaviour;
2. that overall, both beliefs and social pressures will have a statistically significant influence on intentions;
3. that for girls and boys taken separately, both beliefs and social pressures will have a statistically significant influence on intentions;
4. that for the different age groups taken separately, both beliefs and social pressures will have a statistically significant influence on intentions;
5. that there are no statistically significant differences between the mean beliefs, social pressures and intentions which are attributable to age or gender.

(The literature and common sense indicate that the 'null hypothesis' would be inappropriate in respect of hypotheses 1 to 4.)

An adaptation of the Ajzen and Fishbein model is applied to this investigation and the testing of these hypotheses. This model reflects the rationale of recent curriculum initiatives in Health Education.

**The Ajzen and Fishbein Model**

Ajzen and Fishbein (1980, pp.5-9) propose a Theory of Reasoned Action: 'human beings are usually quite rational and make systematic use of the information available to them'.

They suggest that a person's intentions, when expressed in terms of action, target, context and time, closely correspond with their subsequent behaviour. Intentions are seen as a function of:

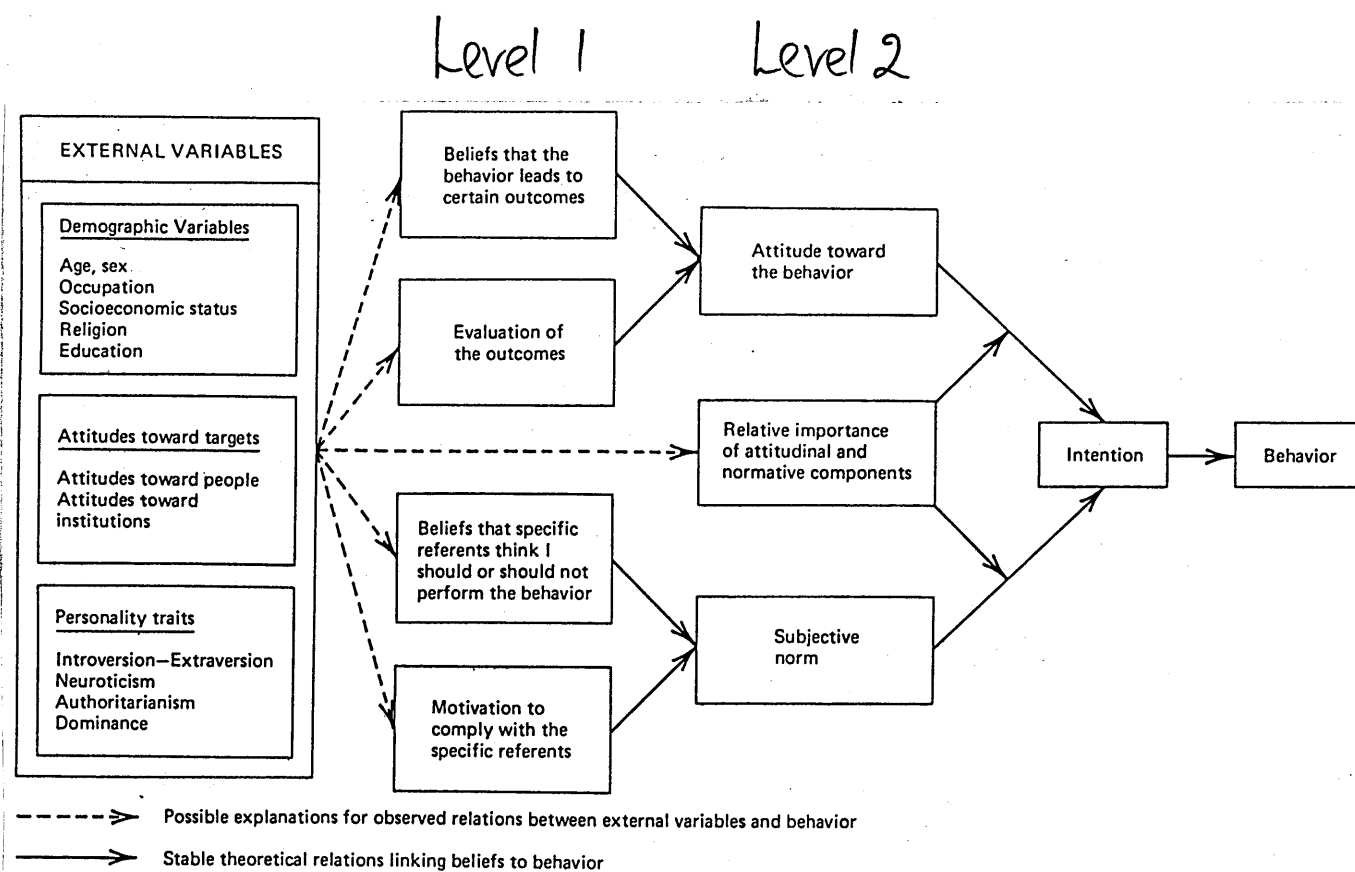
- a) attitudes towards the behaviour and
- b) subjective norms (perceptions of social pressures to behave in particular ways).

Numerous beliefs underly attitudes and subjective norms, and these beliefs are influenced by a number of external variables, including information received. Thus exposure to information (e.g. the Health Education curriculum) which is intended to change beliefs, and to activities designed to give adolescents confidence to resist social pressures, should change behaviour.



The model may be represented thus:

**Fig. 1. Indirect effects of external variables on behaviour**



(reproduced from Ajzen and Fishbein 1980 p.84)

This model has been used extensively in connection with the investigation of aspects of the health behaviour of adults. The development of the model is discussed in the next chapter and its application to the investigation of factors influencing adolescent health behaviour is discussed in Chapter 3.

**THE MEASUREMENT OF ATTITUDES AND THE PREDICTION OF BEHAVIOUR****Attitudes**

The word 'attitude' is derived from the Latin 'aptus', meaning fitness or adaptedness, that is a mental preparation for action (indicating motor response). Allport (1954), reviewing attitudes in the history of social psychology, shows how the definition of attitudes has developed from the late nineteenth century to his own widely accepted definition of 1935. He defined an attitude as 'a mental or neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related'.

Thus if attitudes are a predisposition to behave in a certain way, then knowledge of attitudes should enable that behaviour to be predicted. For this reason, between the two World Wars, great interest was shown in the measurement of attitudes and various scaling techniques were developed for this purpose.

**The measurement of attitudes*****Thurstone's equal-appearing interval scales***

Thurstone and Chave (1929) devised a method of measuring attitudes, and first applied it to measuring attitudes towards the church. Their chief pre-occupation was to produce a scale with equal-appearing intervals. To produce a Thurstone scale (Oppenheim 1966 pp.125-133), a large number of statements of attitude is collected from the target population. The statements are then given to a group

of people who act as 'judges'. Each judge is asked to imagine a rating scale with eleven equal intervals, ranging from strongly positive to strongly negative, and to assign each statement to an appropriate scale position. The items which are accepted for the scale are the ones about which the judges are in close agreement; the other items are rejected. The scale value of each retained item is the median of the judges' ratings. The actual selection of items for the final scale is in terms of the intervals between their scale values, the intention being to obtain a scale in which the intervals are equal. They are then assembled in random order and respondents are asked to agree or disagree with each one. Subsequently the scale value of each agreed item is looked up and the median of these constitutes the respondent's score. In practice, the Thurstone scales involve a lot of preparatory work and it is often difficult to find a suitable panel of judges.

### ***Likert's summated rating scales***

Likert (1932) proposed a method of summated ratings. The aim of this technique is to produce a scale which is uni-dimensional, i.e. a scale in which all of the items measure the same thing. First a pool of items is collected (Oppenheim 1966 op cit, pp.133-143). Respondents place themselves on an attitude continuum for each statement, which is usually divided into five positions ranging from strongly agree to strongly disagree. Each position is assigned a weighting and the respondent's score is the sum of the weighting for all items. To accomodate statements phrased negatively, the direction of the weightings is reversed. Statements reflecting neutral attitudes, which

are acceptable on a differential scale, are of no value in a summated rating scale. Items are of most value when they elicit responses at the extremities of the attitude continuum. Item analysis by factor analysis follows: this procedure was slow and tedious (Oppenheim op cit) until main frame computers became generally available to researchers. Factor analysis is a statistical technique based on intercorrelation. Responses to the statements in the item pool are intercorrelated and factor analysed. Items which have high 'loadings' on the factor(s) (attitude(s)) to be measured are retained and the others items are rejected. Thus the item pool is reduced and uni-dimensionality of each scale is ensured. This method of measuring attitudes is sometimes criticized because of its lack of reproducibility: the same total score for each scale may be obtained in many different ways.

### ***Guttman's scalogram-analysis***

Guttman proposed his scalogram analysis in 1950. His chief concerns were uni-dimensionality and reproducibility. (Oppenheim 1966, op cit, pp.143-151). Items in a Guttman scale have the properties of being ordinal and cumulative. For example: lead, glass and diamond may be ordered according to their cumulative degree of hardness. If a dozen or more degrees of attitude from good to bad, or positive to negative, etc. are similarly ranked in order, many respondents will endorse the early ones, but sooner or later they will 'cross over' and fail to endorse the remaining items. Thus each level subsumes the agreement to the previous levels. The point of cross over is the respondent's individual score. Ways of placing items in

hierarchical cumulative order are described by Oppenheim (op cit, pp.145-151) and Fishbein and Ajzen (1977, pp.65-68). The value of scalogram-analysis is that it provides the important safeguard of uni-dimensionality and is useful to examine small shifts in attitude. Oppenheim says that Guttman has been criticized for his insistence on reproducibility and for the laborious nature of the procedures which in the end are not certain to produce a usable scale.

### ***Osgood's semantic differential***

Osgood et al (1957) developed the semantic differential technique. The respondent is presented with one or more concepts to differentiate and a set of bi-polar adjectives, which lie at the ends of a five or seven point scale, against which to do it, e.g.:

I think school is:

good.....	bad
interesting.....	dull
pleasant.....	unpleasant

etc.

The responses may be subjected to factor analysis, and Osgood et al, analysing a large number of studies, have repeatedly found three basic factors, or dimensions underlying differential ratings:

evaluation;  
potency;  
activity.

(Fishbein and Ajzen 1975, p.75)

The theoretical framework of the semantic differential has frequently been extended by Kelly (1955) and others in the repertory grid technique, where respondents supply, under guidance, their own bi-polar adjectives (called

'constructs').

### ***The Ajzen and Fishbein approach***

Reviewing the whole field of attitudes and their measurement, Fishbein and Ajzen (1975, pp.1-2) claim that the term attitude 'is characterised by an embarrassing degree of ambiguity and confusion'. This is probably because few researchers agree on an explicit definition of 'attitude' and the term has been used in a general sense to include feelings, beliefs, values, perceptions, opinions, intentions etc.. Further, consistent with this multi-dimensional definition, researchers have attempted to measure attitudes by asking questions designed to 'access presumed constituents' and to adapt measuring instruments to fit the purpose of their study. It is not surprising therefore that the measurement of attitudes has shown great diversity.

In the classical scaling techniques (i.e. Thurstone, Likert, Guttman and Osgood) described above, measurement ultimately rests on responses to single statements of belief or intention on a bipolar (or two unipolar) scales, e.g. measuring attitudes to school, using the Likert approach:

Going to school is good fun.

Strongly agree		agree		uncertain		disagree		Strongly disagree
+2		+1		0		-1		-2

Standard attitude scaling is designed to select a set of beliefs or intentional statements which can be used to measure a person's attitude. Responses to such a set of statements indicate the *strength* of beliefs or intentions;

a measure of *evaluation* is not obtained from the person whose attitude is measured, but rather, it is assigned by the investigator, and it is assumed to be the same for all respondents. To meet this condition of uniform evaluations, many items are eliminated by the various scaling techniques (Fishbein and Ajzen 1975, pp.79-89).

Fishbein and Ajzen (1975, pp.222-223) argue that responses to any belief or intentional statement can serve as an indicant of a person's attitude, provided that his or her own evaluation associated the belief or intention are known. This is key characteristic of their approach. They suggest that beliefs (b) and their evaluation (e) can be measured simultaneously for each respondent, and the summed products of (b) and (e) thus obtained can serve as a measure of attitude, in accordance with an *expectancy - value model*.

### **Attitudes and behaviour**

Ajzen and Fishbein (1980, pp.16-17) suggest that despite the concern expressed by Allport (1935) and others about the complexity of the attitude concept, early research seemed to confirm the validity of unidimensional attitude scales, by showing that people who *behave* in different ways also differ predictably in their attitudes, as thus measured. For example, it was found that union members have more favourable attitudes to labour unions than does management, that pacifists have more negative attitudes toward war than non-pacifists and that (in the USA) northerners are more favourable toward blacks than are southerners. Because of this apparent link between behaviour and attitude, it was assumed that the reverse would be equally valid, that there

would be a close link between attitudes and behaviour. This lead researchers to test the assumption that attitude measurements can *predict* behaviour.

But scores on attitude scales often do *not* serve as good behavioural predispositions. The research findings of LaPiere and of Corey are frequently cited as examples of studies which demonstrate this. LaPiere (1934) investigated racial prejudice. He accompanied a Chinese couple in their travels through the USA and in over 250 instances they were refused service only once. Yet the majority of the hoteliers and restaurant owners involved, when questioned later, said that they would *not* accept members of the Chinese race as guests. It should be noted, however, that LaPiere's measure of attitude consisted of a single question only. Corey (1937) measured students' attitudes towards cheating using a Likert Scale. The students subsequently were given access to their 'true-false' examination papers, apparently ungraded, and told to mark them themselves. The measurement of their 'cheating behaviour' bore no relationship to the measures of their attitudes towards cheating. Ajzen and Fishbein (1980, p.18) suggest that the lack of correspondence between attitude and behaviour reported by LaPiere and by Corey is due to attitude being only *one* of many factors determining behaviour.

Tittle and Hill (1967), reviewed fifteen studies of the relationship between measured attitude and behaviour, including those of LaPiere and of Corey. Six of them showed low, three moderate, and six high correspondence and they concluded that the strength of the relationship between



measured attitude and subsequent behaviour is dependant upon three factors:

- 1 'the measurement technique employed'  
(attitude measures using single questions showed low correspondence),
- 2 'the degree to which the criterion behavior constitutes action within the individuals' common range of experience '  
(i.e. whether the behaviour is customary),
- 3 'the degree to which the criterion behavior represents a repetitive behavioral configuration'  
(i.e. whether the behaviour occurs frequently).

Tittle and Hill carried out further investigations themselves and concluded that, 'multi-item attitude instruments would have considerable utility as predictors of behavior when such behavior represents a normal configuration of repetitive actions.' The lack of correspondence between measured attitudes and behaviour, reported by both LaPiere and Corey, are accounted for in points 1 to 3 above. One of these studies relied upon a single statement of attitude and the behaviour on which both focused was unusual.

Wicker (1969) reviewed twenty-five reports of research dating from 1934 to 1969, also including those of LaPiere and Corey. He reported on the correspondence between measured attitude and overt behaviour in each case. He concluded that there is 'little evidence to support the postulated existence of stable, underlying attitudes within the individual, which influence both his verbal expressions and his actions'. He suggested that this has important implications for social researchers:

- 1 there is no evidence that feelings, as measured by attitude scales are translated into actions (behaviour);

- 2 other factors, as well as attitudes, may influence overt behaviour;
- 3 significant correspondence between attitude measures and relevant behaviour should be demonstrated by researchers before they attempt to study social behaviour by assessing attitudes.

Peters (1958) casts doubt on whether there can be an all embracing theory predicting human behaviour. He reviews various theories of motivation, including that of Freud, drive theories, and hedonism and concludes that man is a rule following animal and his behaviour can mostly be explained in terms of a purposive, rule following model. Such rules must obviously have social origins.

Despite the doubt cast on the value of measured attitudes, Acock and Scott (1980) note that the last decade has witnessed a renewed interest in the pivotal role of the attitude concept in accounting for behaviour. They cite a number of workers, including Wicker (1969 op cit) and Ajzen and Fishbein (1977). They report that three themes flow through this literature: social influence; the differential impact of social pressures on behaviours open to public inspection as opposed to low visibility behaviours; the problems of measurement.

Fishbein and Ajzen (1975, p.301) embrace these three themes in their proposed model for predicting behaviour. They state that 'In a given situation, a person is assumed to hold or to form a specific *behavioural intention* which influences his subsequent overt behaviour ... There are two major factors that determine behavioural intentions: a personal 'attitudinal' factor and a social or 'normative' factor. These two components influence behavioural intentions by

different amounts. Their relative 'weights' are determined empirically. Expressed symbolically:

$$B \sim I = (A_B)w_1 + (SN)w_2$$

where:

B is the behaviour;  
I is the intention to perform the behaviour;  
 $A_B$  is the attitude towards performing the behaviour;  
SN is the subjective norm;  
 $w_1$  and  $w_2$  are empirically determined weights.

$A_B$ , the attitude towards performing the behaviour in question, is proposed to be a function of the perceived consequences of performing that behaviour and of the person's evaluation of those consequences. Thus:

$$A_B = \sum_{i=1}^n b_i e_i$$

where:

$b_i$  is the belief that performing behaviour B leads to consequences or outcome i;  
 $e_i$  is the person's evaluation of outcome i;  
n is the number of salient beliefs the person holds about performing behaviour B.

The normative component, SN deals with the influence of social environment on behaviour. The subjective norm is the person's perception that most people who are important to him think that he should or should not perform the behaviour in question. According to the theory, the general subjective norm is determined by the perceived expectations of specific relevant individuals or groups, and by the person's motivation to comply with those expectations.

$$SN = \sum_{j=1}^n b_j m_j$$

where:

$b_j$  is the normative belief (i.e. the person's belief that a reference group or individual j thinks he should or should not perform behaviour B);

$m_j$  is the motivation to comply with the referent j;  
n is the number of relevant referents.

Fishbein and Ajzen (1975 p.308) claim substantial empirical support for this intention model, based on a number of different types of investigations. The research findings of Jaccard and Davidson (1972) concerning 'the use of birth control pills' serves as their example. Subjects were asked to rate the concept of using the birth control pill on a set of evaluative semantic differential scales. This measure of attitude was found to be highly related to the subject's belief about the consequences of using birth control pills and their evaluations of these consequences, that is expectancy-value model. In this study 15 salient beliefs were previously elicited from an independent sample of women: the same women were also asked to name 'important others' who may influence their use of the pill. Twelve significant referents were elicited, these being the ones mentioned most frequently. The normative beliefs concerning each referent were assessed in the following way:

My mother thinks  
I should-----I should not  
use birth control pills.

Motivation to comply with each referent was measured:

In general  
I want to-----I want not to  
do as my mother thinks I should.

The investigators performed multiple regression analysis and found a multiple correlation of 0.835 for the prediction of intention to use birth control pills from a weighted combination of the attitudinal and normative components of the theory. Fishbein and Ajzen claim that 'this high correlation is representative of the results obtained in

most investigations'.

A further development of this model is reported by Ajzen and Fishbein (1977). They suggest that 'attitudinal and behavioural entities may be viewed as consisting of FOUR different elements: the action, the target at which the action is directed, the context in which the action is performed, and the time at which it is performed'. They state that behavioural criteria based on single observations will always involve these four specific elements, and that the strength of an attitude - behaviour relationship depends in large part on the degree of correspondence between the attitudinal and the behavioural entities.

What Ajzen and Fishbein suggest may be represented as follows:

Attitude measured towards:	Corresponding behaviour	Strength of prediction
-----	-----	-----
1) 'my church' (no action, context, time)	Different behaviours w.r.t. church eg. attending services, donating money, participating in social events. etc.	Poor prediction
2) 'donating money to my church' (no time)	Index of monetary donations	Good prediction
3) 'Attending worship service at my church at 10.00 am next Sunday' (all elements included)	Attending worship service at my church at 10.00 am next Sunday	Very good prediction
-----	-----	-----

Ajzen and Fishbein (1977) analysed numerous research reports and constructed a table showing the effect of correspondence on Attitude - Behaviour relationships:

The Effect of Correspondence on Attitude-Behaviour Relations

	Attitude-Behaviour relation		
	(Not significant)	(Low or inconsistent(1))	(High (2))
Correspondence			
Low	26	1	0
Partial	20	47	4
High:			
questionable measures	0	9	9
appropriate measures	0	0	26

(1)  $r < 0.40$ (2)  $r \geq 0.40$ 

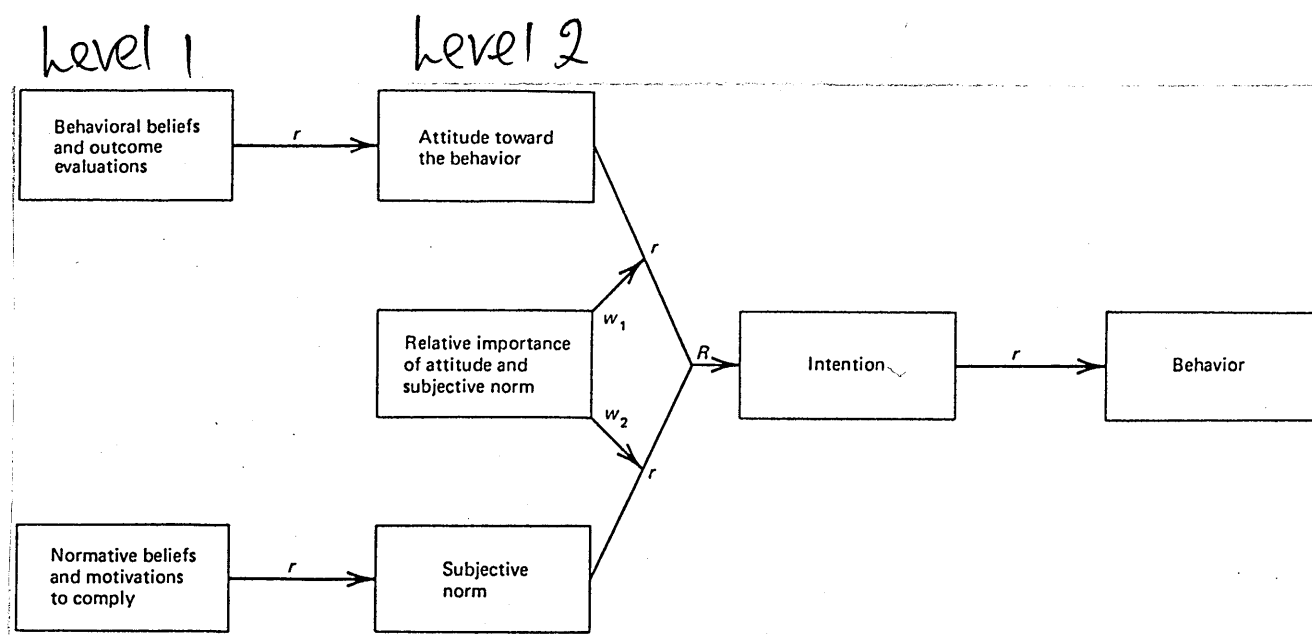
The numbers in the cells represent the number of studies cited

(Ajzen and Fishbein 1977 op cit, p.913)

However, the basis on which they judge the degree of correspondence is not stated in the text, although they say that 'to predict behaviour from attitude the investigator has to ensure high correspondence between at least the target and action elements of the measures he employs'.

Ajzen and Fishbein (1980, pp.5-9) present further developments of their approach. They propose 'a theory of reasoned action' based on the assumption that human beings are usually quite rational, making systematic use of the information available to them and that human social behaviour is not controlled by unconscious motives or overpowering desires. They suggest that the factors determining a persons *behaviour* may be represented by the following model.

**Fig. 2. Relations amongst beliefs, attitude, subjective norm, intention and behaviour.**



(Reproduced from Ajzen and Fishbein 1980, p.100)

They contend that:

1. Intentions (I) are the immediate antecedents of actions and that high correspondence between intention and behaviour is obtained if the measure of intention corresponds to the behavioural criteria of action, target, context and time, provided that the intention is stable.

2. Behavioural intention (I) is determined by attitudes ( $A_B$ ) and subjective norms (SN), the relative importance of the two components varying from one behaviour to another and one individual to another. They emphasize the necessity of ensuring correspondence (in terms of action, target, context and time) between statements of intention, attitude and subjective norms, citing multiple correlation coefficients ( $R$  above) in the region of 0.7 to 0.9, e.g. Sperber et al,

(1980)  $R=0.85$ ; Fishbein et al (1980a),  $R=0.89$ ; Fishbein and Ajzen (1980),  $R=0.79$ ,  $0.70$ ,  $0.75$ ; Fishbein et al (1980c),  $R=0.89$ .

3. Attitudes ( $A_B$ ) are based on a set of a person's salient beliefs measured by the summed products of beliefs ( $b$ ) and evaluation of these beliefs ( $e$ ). Beliefs about a particular behaviour are elicited from a sample population by asking questions such as:

What do you think are the advantages of using birth control pills?

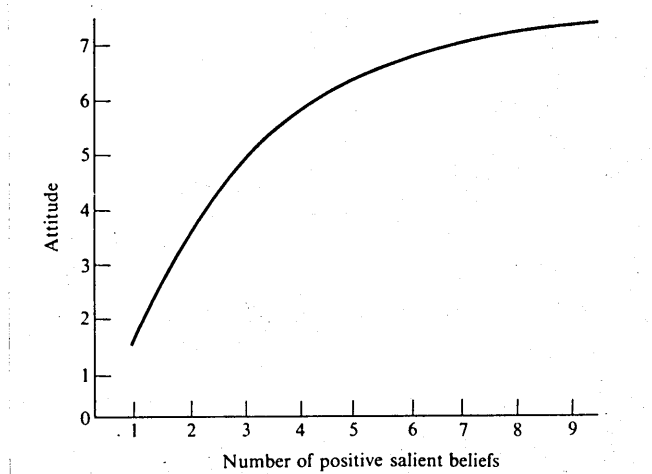
What do you think are the disadvantages of using birth control pills?

Is there anything else which you associate with the use of birth control pills?

The responses which occur most frequently form the 'modal salient beliefs'. One effect or belief may be expressed in several ways (e.g. 'makes me vomit'; 'makes me throw up'); the investigator will need to 'use common sense' in extracting the salient beliefs from the responses. Fishbein and Ajzen (1975) state that the magnitude of attitude index ( $\sum_{i=1}^n b_i e_i$ ) does not increase indefinitely with acquisition of new beliefs, because attitude is determined by a hierarchically organised, limited number of salient beliefs. Generally speaking the theoretical relationship between number of positive beliefs and attitude (with evaluation held constant) is described by the following model.



**Fig. 3. Attitude as a function of positive number of beliefs, with attribute evaluation held constant.**



(reproduced from Fishbein and Ajzen 1975, p.224)

Each additional belief contributes less to the total attitude measurement.

4. Subjective norms (SN) are based on a set of normative beliefs, and measured by the summed products of normative beliefs (b) and motivation to comply with the referent (m). The salient referents are elicited as described earlier (page 2.11), the questionnaire format being similar to those described.

Ajzen and Fishbein (1980, p.84) focus attention on effects of external variables. Figure 1 (p.1.19) illustrates how these variables can influence intentions and behaviour indirectly by their effects on behavioural beliefs, outcome evaluation, normative beliefs, motivation to comply, or relative weight of the attitudinal and normative components.

**Precedents for applying the Ajzen and Fishbein model to the investigation of health behaviour.**

The Ajzen and Fishbein Model has been used to investigate a wide variety of activities, e.g. voting (Fishbein et al 1976), church attendance (Brinberg 1979), water conservation (Kantola et al 1982), political participation (Acock et al 1980), sentence recommendations for hypothetical defendants (Katz 1982) and consumer behaviour (Fishbein and Ajzen 1980).

Numerous researchers have also successfully applied the model, or parts of the model, to the health behaviour field, for example:

Family planning (Fishbein et al 1980a pp.130-147);

Child bearing intentions (Loken and Fishbein 1980, pp.202-223);

Using birth control pills (Herold and Goodwin 1980);

Male oral contraceptive use (Jaccard 1981);

Changing contraceptive usage intentions (McCarty 1981);

Weight loss (Sejwacz et al 1980 pp.101-112);

Weight reduction (Saltzer 1981);

Smoking attitudes and behaviour (Marsh and Matheson 1983);

Changing the behaviour of alcoholics (Fishbein et al 1980b pp.217-242);

Adolescent alcohol use (Schlegel, Crawford, Sanborn 1977);

Drug use (Cook et al 1980);

Drug use and intentions (Lacy 1980);

Smoking marijuana (Ajzen, Timko, White 1982);

Drug use (Bentler and Speckhart 1979);

Marijuana Intentions (Bearden and Woodside 1978);

Oral hygiene (Beck and Lund 1981);

Tuberculosis detection drive (Wurtele, Roberts, Leeper 1982);

Exercise (Bentler and Speckhart 1981);

*(Some of these investigations are reviewed later.)*

Thus the model has been used to investigate a variety of different types of health behaviour in adults. Schlegel, Crawford and Sanborn (1977 op cit) claim '... support for the application of the Ajzen and Fishbein model to a new field of behaviour, alcohol drinking by adolescents.' There is thus an established precedent for this present study.

## USING THE AJZEN AND FISHBEIN MODEL TO INVESTIGATE FACTORS AFFECTING ADOLESCENT HEALTH BEHAVIOUR

### First attempt

In a first attempt to test the applicability of the Ajzen and Fishbein model to the health behaviour of adolescents, Likert-type instruments were developed. They were designed to operate at Level 2 (my label) shown in the model on pages 1.19 and 2.14, measuring 'attitudes towards the behaviour' and 'subjective norms'. Intentions would be measured in terms of action, target, context and time, as stipulated by Ajzen and Fishbein. Regression analysis would then be used in establishing the relative importance of Attitudes and Subjective Norms in determining Intentions in relation to these health behaviours.

The customary procedures were followed (see Appendix 01), and a questionnaire for piloting was constructed which contained approximately 70 items, referring to beliefs about and social pressures concerning smoking cigarettes, drinking alcohol, keeping fit, eating a healthy diet. The survey was completed by approximately 250 secondary school pupils aged 11-18 years. The scores were entered onto a computer file and Factor Analysed. The results showed:

- a) low inter-item correlations;
- b) large numbers of ill-determined factors;
- c) 'embryo' factors emerging giving scales with low McKennell's alphas ( $<0.55$ );
- d) these 'embryo' factors were mainly concerned with smoking, alcohol, keeping fit and diet as separate entities;
- e) only two 'embryo' factors defining *general health* behaviour emerged.

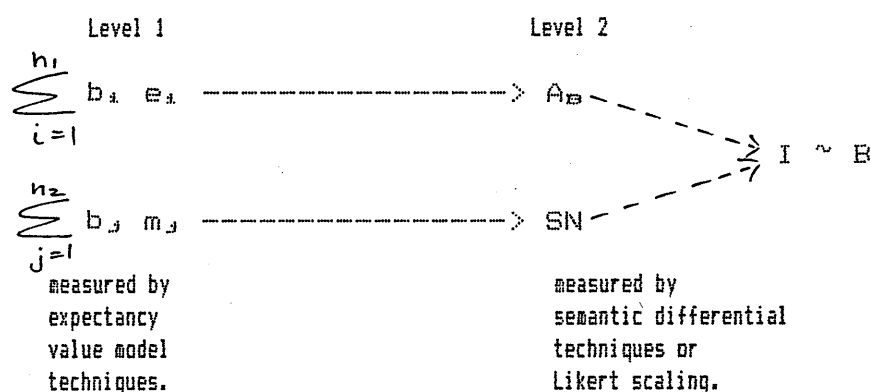
This indicated that:

- 1) teenagers do not view health behaviour as a unified concept;
- 2) highly emotional and sometimes covert attitude statements are not effective in measuring Personal Attitudes and Subjective Norms in this context.

*A full account of this attempt is included as Appendix 01.*

### **This present study**

Thus an attempt to investigate adolescents' health behaviour by traditional Likert scales showed that they do not view health behaviour as a *unified* concept. It was therefore decided to develop separate questionnaires for: smoking; alcohol; keeping fit; diet. The use of Likert type scaling, with its characteristic of high emotionality, seemed not to be suitable for this purpose. The literature was therefore searched to see what alternative approach had been used by Ajzen and Fishbein themselves and subsequent researchers using and adapting their model. Using the symbols defined previously in Chapter Two, the model may be represented:



### **Measurement of Attitudes and Subjective Norms**

Referring to the model on pages 1.19 and 2.14, a review of the literature suggests that there is generally a high correlation between:

1. behavioural beliefs and their evaluation  
 $(\sum_{i=1}^n b_i, e_i)$ , measured by expectancy value techniques (level 1) and attitudes towards behaviour ( $A_B$ ) measured by semantic differential techniques or Likert scaling (level 2).
2. normative beliefs and motivation to comply  
 $(\sum_{j=1}^n b_j, m_j)$  measured by expectancy value techniques (level 1) and subjective norms (SN) measured by a semantic differential technique or Likert scaling (level 2).

For example, high correlations are reported between these above measures by Loken and Fishbein (1980) in an investigation into the effects of occupational variables on child-bearing intentions. They measured the components of the model in the following order:

1. a measure of attitudes toward having a child within the next 3 years ( $A_B$ );
2. eight salient beliefs about the consequences of having a child within the next 3 years ( $b_i$ ) followed by each corresponding evaluation ( $e_i$ ), giving  $\sum b_i e_i$ ;
3. a measure of the subjective norms;
4. five normative beliefs ( $b_j$ ), together with five motivations to comply ( $m_j$ ), giving  $\sum b_j m_j$ ;
5. a measure of intention to have a child within the next three years (BI).

They report that '... the measure of attitude ( $A_B$ ) and its proposed determinants ( $\sum_{i=1}^n b_i e_i$ ), using elicited beliefs only, was highly significant ( $r=0.85$ ,  $p<0.01$ ). Similarly, the correlation between the social normative measure (SN) and its determinants ( $\sum_{j=1}^n b_j m_j$ ) was highly significant, ( $r=0.80$ ,  $p<0.01$ ).

Ajzen and Fishbein (1980) cite further examples of high correlations between these measures (levels 1 and 2 of the model) in studies concerning: understanding womens' occupational orientations (p.123); family planning

behaviours (p.141) and voting in American elections (p.181). Numerous other researchers report similar highly significant correlations.

The question arises as to how best to measure attitudes and subjective norms in this present study. The possibilities are:

- a. expectancy-value attitude and subjective norm measures, i.e.  $\sum_{i=1}^n b_{i,e_i}$  and  $\sum_{j=1}^m b_{j,m_j}$  (level 1 only);
- b. semantic differential measures for  $A_B$  and SN (level 2 only);
- c. both of the above measures;
- d. various mixtures of a. and b. above.

A review of the literature indicates that all the above options have been tried.

Researchers interested in the diagnosis of attitudes and subjective norms have tended to use only the expectancy-value technique (a. above) to measure behaviour beliefs and their evaluations, together with normative beliefs and their motivation to comply, for example: Jaccard (1981) measuring attitudes towards male contraceptive pills; March and Matheson (1983) investigating smoking attitudes and behaviour and Lacy (1981) studying drug use.

Researchers interested in testing the the model, together with other models and suggesting modifications, tend to use the semantic differential technique only (b. above), for example: Bentler and Speckart (1979), developing models to explain the use of certain drugs; Bentler and Speckart (1981), developing models using students attitudes and behaviour towards studying, exercise and dating and

Schlegel, Crawford and Sanborn (1977) in application of the Fishbein model to adolescents' alcohol use.

The semantic differential technique measures 'overall influences', which are probably the most appropriate measures for testing, comparing and modifying models.

Researchers mainly interested in testing the Ajzen and Fishbein model and its validity have tended to use both types of measures (c. and d. above). Other researchers interested in diagnosis and explanation of attitudes and subjective norms have also used both types of measures. Some report that the attitude-intention relationship is stronger when expectancy-value attitude measures are used as predictors than when semantic differential measures are employed. This was reported by Bagozzi (1981) measuring blood donation behaviour and Brinberg (1979) predicting church attendance.

The aim of the present study is to identify factors which influence health behaviour, that is, the aim is *diagnosis*, thus indicating that expectancy-value measures  $\sum_{i=1}^{n_1} b_i e_i$  and  $\sum_{j=1}^{n_2} b_j m_j$  ought to be employed. Further, Ajzen and Fishbein (1980) state that external variables affect behaviour only indirectly and can be mediated through behavioural beliefs, normative beliefs and their relative 'weightings' (model page 1.19). Other workers have confirmed that exposure to persuasive communications designed to manipulate beliefs will in fact influence intentions (and possibly subsequent behaviour) in compliance with the communications, for instance Beck and Lund (1981) claim



changes in 'oral hygiene intentions' after subjects had been exposed to persuasive messages. This present study is concerned with the influence of Health Education programmes on adolescents' health behaviour. External variables such as new information, might be expected to change beliefs. Hence, the measurement of behavioural beliefs and normative beliefs is central to this study and expectancy-value measures will be used to measure them.

### ***The measurement of Intentions***

Central to the Ajzen and Fishbein model is the assumption that behavioural intentions accurately predict behaviour. Saltzer (1981) states that under controlled laboratory conditions, high correlations (approaching 1.0) between intentions and behaviour have been reported and cites Fishbein and Ajzen's (1975) and Hornik's (1970) findings. Further, she cites examples of "high correlations between intentions and behaviour" in studies of voting, alcoholics treatment, pre-marital intercourse, the use of birth control pills. Saltzer (1981) herself, found that behavioural intentions for weight loss are useful predictors of weight loss behaviour for participants in a clinical weight reduction programme. Wurtele, Roberts and Leeper (1981) measured subjects' intentions to return to a clinic, 48 hours after receiving tuberculin vaccine, for a recommended skin test reading. The behavioural intention was found to be an "important predictor" of subsequent behaviour. It could however be argued that this was a special case: the subjects were already committed, having initially attended the clinic voluntarily. They also cite examples of high correlations between intentions and behaviour in

immunisation behaviour, contraceptive choices, weight loss and smoking behaviour, suggesting that 'behavioural intentions would be an important variable for predicting other health related behaviours'.

Therefore it is proposed to measure behavioural intentions in the main survey of this study. The age range in the population to be studied is from 11 to 18 years and extensive interviews with representative groups have indicated that behaviour with respect to drinking alcohol, smoking cigarettes, keeping fit and eating a healthy diet will vary with age, also, Fishbein and Ajzen (1975, p.318) state that varying situations may influence intentions. Therefore, more than one intention statement is required in each survey. For example, 'Intention statements' concerning alcohol:

Do you think you will drink alcoholic drinks at home with your family in the next two weeks?

Do you think you will drink alcoholic drinks in the homes of friends or relatives in the next two weeks?

Do you think you will drink alcoholic drinks with your friends in pubs or clubs in the next two weeks?

(Note that the model's requirement for the specification of action, target, context and time elements is satisfied in these statements.)

There are precedents for using more than one Intention statement: other workers in the field have used several Intention statements for each behaviour in question, for example: Bentler and Speckhart (1979) investigating drug use; Bearden and Woodside (1978) investigating marijuana use and Schlegel, Crawford and Sanborn (1977) investigating adolescent alcohol use.

Ajzen and Fishbein (1980, pp.31-33, 105-106) state that dieting and exercise involve sets of actions rather than single actions, which they term *behavioural categories*. Thus a set of single intention statements must be selected which together are relevant to the category in question. For example, following their formulation, intentions toward taking exercise could be measured by the following set of statements:

Are you planning to do physical exercise alone like jogging, aerobics, swimming, bicycle riding, walking, etc. in the next two weeks?

Are you planning to take part in sport with other people outside school such as squash, badminton, football, tennis, hockey, etc. in the next two weeks?

Are you planning to avoid long periods of inactivity like watching a lot of TV or just sitting around, in the next two weeks?

In these ways behavioural Intentions concerning keeping fit will be measured.

### ***The influence of past behaviour***

Several workers have shown that past behaviour can influence future behaviour, either directly or indirectly. Bentler and Speckhart (1979) found past behaviour as well as attitudes and subjective norms 'account for a significant degree of variability in behaviour'. Lacy (1981) showed that past behaviour affects behavioural intentions directly. Thus, various modifications to the Ajzen and Fishbein model have been proposed in the light of such findings. The present study is concerned with the behaviour of adolescents, whose behaviour patterns are still developing, it can thus legitimately be assumed that they will not have developed set patterns of past behaviour, which may

influence their intentions. The influence of past behaviour will therefore not be included in the model and self-reports of past behaviour will not be collected.

### Summary

Thus a modified version of the Ajzen and Fishbein model was used and the following was measured for: drinking alcohol; smoking cigarettes; keeping fit and diet, using separate questionnaires for each.

$$\sum_{i=1}^{n_1} b_i e_i + \sum_{j=1}^{n_2} b_j m_j \rightarrow I$$

Where:

$b_i$  is the belief that performing a particular behaviour leads to consequences or outcomes  $i$ ;

$e_i$  is the person's evaluation of outcome  $i$ ;

$n_1$  is the number of salient beliefs the person holds about performing that particular behaviour;

$b_j$  is the normative belief, i.e. the person's belief that a reference group or individual  $j$  thinks that he should or should not perform a particular behaviour;

$m_j$  is the motivation to comply with the referent  $j$ ;

$n_2$  is the number of relevant referents;

$I$  is the Intention to perform that particular behaviour.

The elicitation of Intentions, Salient Beliefs and Significant Referents is described in Chapter 4.

## ELICITING INTENTIONS, SALIENT BELIEFS AND SIGNIFICANT REFERENTS

### **Eliciting Intentions**

Ajzen and Fishbein (1980, p.42) claim that a person's Intentions, expressed in terms of action, target, context and time, closely correspond with subsequent behaviour.

The elicitation of Intentions to:

drink alcoholic drinks;

smoke cigarettes;

be physically vigorously active or just 'sit around';

eat particular types of food;

was done in discussions with small groups of pupils, of 'mixed ability' aged between 11 and 18 years, in several schools (i.e. representative of the population in the study). They were asked in what situations (context) and when (time) they were likely to drink (action) alcoholic drinks (target), smoke cigarettes, take regular exercise and eat particular types of food.

### ***Drinking alcoholic drinks***

These discussions revealed that pupils were likely to drink alcoholic drinks in the following contexts:

at home with their families;

at the homes of friends and relatives, at parties or celebrations and at 'ordinary times';

in clubs and pubs.

A number of quite young girls (aged 13 to 14 years), mainly in urban schools, claimed that they regularly drank alcoholic drinks in public bars. Quite a lot of boys and girls also of this age said that they regularly drank

alcoholic drinks in clubs with their parents and grandparents.

Most pupils said that they would be likely to drink alcoholic drinks at least once a month (time).

### ***Smoking cigarettes***

The discussions indicated that pupils were likely to smoke cigarettes in the following contexts:

when they were alone;

when they were with friends;

(both of these in a large number of situations, e.g. at home, at school, in the street, in the park)

at parties and discos.

Large numbers of pupils spoke of the peer group pressure to smoke at parties and discos. Pupils in the urban schools spoke of freely accessible cigarette vending machines, at commercially run discos catering specially for 13 to 15 year olds.

A number of pupils said they would smoke at discos and that this would happen at least once a month (time).

### ***Keeping Fit***

For keeping fit, the *behavioural categories* suggested by Ajzen and Fishbein (1980) (see p. 3.8) were used. Pupils were asked what sorts of exercises they were likely to take and in what company. They were also asked about times of physical inactivity. From their replies, a list of common activities and 'inactivities' and the context in which these occurred was drawn up for use in the keeping fit questionnaire.

Many pupils said that they regularly took part in sporting activities and / or physical exercise at least once a week (time).

### **Diet**

The way in which Intentions were established with regard to drinking alcohol, smoking cigarettes, and keeping fit was thus grounded in what pupils had to say about their own experience. Intentions with regard to diet were derived differently. For context the interviews indicated that they were likely to eat in all the obvious places, e.g.:

- at home;
- at school;
- at the homes of friends;
- at the homes of relatives;
- in the street;
- in cafes, restaurants, and 'fast food' bars;
- etc..

Of overwhelming significance to health behaviour however was what pupils were likely regularly to eat in relation to what is currently considered to be good dietary practice. Rather than ask them to list what they habitually ate, therefore, it was decided to present in the Intention questionnaire, a list of 11 foods derived from the recommendations in the NACNE Report (1983). Pupils were asked about their intentions with respect to these in the immediate future (time).

To permute these items with a lengthy context list was considered unnecessary, since the issue was one of

'whether' rather than 'where'.

### **Eliciting salient beliefs and significant referents**

Ajzen and Fishbein (1980) suggest that to elicit the beliefs underlying a person's attitude towards *behaviour*, the following type of question could be asked:

What do you believe are the advantages and disadvantages of ----- ?

What else do you associate with ----- ?

To elicit significant referents, they suggest that respondents could be asked to list referents in response to a question such as:

If you consider -----, there might be individuals or groups who would think you should or should not perform this behaviour. List the individuals or groups that come to mind.

The wording and language of these questions were considered to be too difficult for secondary school pupils to understand. Modified questions concerning the following behaviours were prepared:

- (i) drinking alcoholic drinks.
- (ii) smoking cigarettes.
- (iii) keeping fit.
- (iv) eating a healthy diet.

The questions concerned with each topic were written on separate overhead transparencies. Teaching groups of secondary school pupils of mixed ability, aged 11-18 years, were asked to answer (in writing) one, or at the most two sets of questions. Each set of questions was answered by approximately 150 pupils (50 aged 11-13 years; 50 aged 13-15 years; 50 aged 15-18 years.)



**Salient beliefs and significant referents with respect to drinking alcoholic drinks.**

Pupils were asked to respond to the following:

1. Make a list of what you think are the most pleasant/ agreeable/ nice things about drinking *alcoholic* drinks.
2. Make a list of what you think are the most unpleasant/ disagreeable things and problems connected with drinking *alcoholic* drinks.
3. Make a list of any other comments you wish to make about drinking *alcoholic* drinks.
4. Would anybody mind or care if you drank *alcoholic* drinks?
  - a) Name those who might tell you that drinking *alcoholic* drinks is bad for you.
  - b) Name those who don't mind if you drink a little.
  - c) Name those who might encourage you to drink a lot.

These questions were selected after careful piloting. For example in questions 1, 2 and 3, if they were not asked to make a list, some pupils wrote an extended paragraph from which it was difficult to elicit salient beliefs. The original wording of question 4 was "who influences your drinking of *alcoholic* drinks?" followed by parts a), b), c). Many second year pupils thought 'influence' meant 'encourage', hence the phrase 'mind or care' was substituted for 'influence'.

In all, 161 pupils responded. Their answers were analysed as suggested by Ajzen and Fishbein (1980, pp.68-70) as follows. The responses which occurred most frequently to questions 1,2 and 3, form the 'modal salient beliefs' and to question 4 the 'significant referents'.

***Salient Beliefs***

One effect or belief may be expressed in several ways e.g.:

'drinking alcohol makes you happy'

'drinking alcohol cheers you up'

'drinking alcohol makes you look on the bright side'

Similar statements such as these, were grouped together. Sometimes it was difficult to decide if two statements referred to the same or different outcomes, eg. 'drinking alcohol makes me feel good.'

'drinking alcohol helps me to relax.'

A useful 'rule of thumb' is to see if individual respondents list both consequences: if so, the two should be treated separately. Individuals tended to list both of the statements in the example above, showing that 'makes me feel good' does not group with 'helps me to relax'. In fact 'makes me feel good' generally grouped with 'makes me feel happy'.

In addition to making a statement concerning being 'out of control' after drinking alcohol, many individual pupils also made a statement referring to 'drinking and driving'. Thus, pupils saw these as two separate beliefs. One might speculate that 'drinking and driving' endangers other people's lives as well as the life of the drinker, whereas 'being out of control' could cause harm or inconvenience mainly to the drinker, and not necessarily to other people.

The beliefs about 'drinking alcoholic drinks', of pupils of mixed ability in Years 1 to 7 of a comprehensive school, are shown in Tables 1 and 2 which follow.

These tables depict the grouping of beliefs about the 'Advantages' and 'Disadvantages' respectively of drinking alcoholic drinks. Column 1 in each table lists the belief group titles. Examples of the statements which cluster to form each group are given in column 2. The total number of statements made for each group or cluster is given in the penultimate column and its percentage of all statements made is given in the last column. Columns 3 to 8 present the percentages for each belief group of all statements made by pupils in Years 1 to Years 6 and 7 respectively. By inspection of these columns, the rank order of the salient beliefs of each age level can be determined.

## STATEMENTS ABOUT DRINKING ALCOHOLIC DRINKS.

TABLE 1 : ADVANTAGES.

Group Identity	Examples of statements made about the ADVANTAGES of drinking alcoholic drinks	Percentages of total relevant statements made.							Statements No. % of total N=849	
		Age:	Yr 1 11-12	Yr 2 12-13	Yr 3 13-14	Yr 4 14-15	Yr 5 15-16	Yr 6-7 16-18		
			yrs. n=20	yrs. n=28	yrs. n=31	yrs. n=24	yrs. n=24	yrs. n=34		
Taste	I like the taste.									
	It has a pleasant taste.									
	It has a nice taste.		17.5	15	9.2	4.9	10.4	8.1	83	9.8
	Tastes good.									
	It has a nice sweet taste.									
Sociability	Helps you get on with new people.									
	Helps you socialise.									
	Helps with meeting people.		1.8	1	3	10.6	12.2	14.5	72	8.5
	Makes me more sociable.									
	Helps you join a group / crowd.									
Good mood, feeling happy	Makes you happy.									
	Puts me in a good mood.									
	Makes you merry.									
	Makes you feel good.									
	Helps me cheer up.									
	Makes you carefree.		3.5	9	8.2	9.8	10.4	7.2	72	8.4
	Makes you feel better.									
	You haven't a care.									
	Makes me feel nice.									
	Makes me cheerful.									
Relaxation	Relaxes you.									
	Calm my nerves.									
	Removes pressure / worries.		1.8	4	6.7	8.1	5.2	5.9	49	5.8
	Soothes my nerves.									
	Relieves tension.									
Social confidence	Gives you confidence.									
	Helps you pluck up courage.									
	Helps you with shyness.									
	Helps you lose inhibitions.		0	1	0	1.6	3.9	8.1	27	3.2
	Increases your boldness.									
	Gives you courage.									
Maturity	You feel less inhibited.									
	Makes you feel grown-up.									
	Makes you look 'big'.		8.8	6	2.5	1.6	1.3	0	20	2.4
	I like to join in with grown-ups.									
Refreshment	Makes me feel older.									
	It has a refreshing effect.		1.8	1	5.6	0.8	0	0.5	15	1.8
	It is refreshing.									
Small amount	A small amount of alcohol is good for you.		0	0	1.5	0	2	1.9	10	1.2

Total number of statements concerning the ADVANTAGES of drinking alcohol=347  
(to be carried forward to TABLE 2)

TABLE 2 : DISADVANTAGES.

Group Identity	Examples of statements made about the DISADVANTAGES of drinking alcoholic drinks	Percentages of total relevant statements made.							Statements No. % of total N=849	
		Age: 11-12 yrs. n=20	Yr 1 12-13 yrs. n=28	Yr 2 13-14 yrs. n=31	Yr 3 14-15 yrs. n=24	Yr 4 15-16 yrs. n=24	Yr 5 16-18 yrs. n=34	Yr 6-7		
Out of control	Do / say things you don't mean.									
	Makes you drunk.									
	You act irresponsibly.									
	Have accidents and fall about.	22.8	19.0	13.8	13.8	6.5	5.9	99	11.7	
	People act stupid after drinking.									
	People can take advantage of you.									
Damage to health	You take risks.									
	It's bad for your health.									
	It makes you unhealthy.									
	Damages liver / heart / brain.	8.8	10.0	8.7	6.5	7.8	7.6	69	8.1	
Addictive	Makes you fat.									
	Alcohol is addictive.									
	It's hard to kick the habit.	7.0	1.0	12.3	7.3	8.4	7.7	68	8.0	
Drinking and driving	You can become an alcoholic.									
	You can kill people if you drive when you have been drinking.									
	You shouldn't drink and drive.	7.0	5.0	10.2	7.3	6.5	6.3	62	7.3	
	They should stop people driving when they've been drinking.									
Makes you sick / ill										
	Alcohol makes me feel sick / ill									
	Sick if you have too much.	10.5	8.0	3.6	8.1	5.2	5.9	52	6.1	
Cost	Makes me ill.									
	Drinks are expensive.									
	Money can go on drinking.									
	Causes money problems.	1.8	4.0	2.0	9.0	8.4	6.7	48	5.7	
	Ruins people financially.									
Gives you hangover	Drinking is a waste of money.									
	You can get terrible hangovers the next day.									
	Gives me a hangover if I drink a lot.	1.8	8.0	5.1	7.3	3.9	6.3	48	5.7	
Violence										
	Alcohol causes violence / fights / rowdiness.									
	People get into trouble.	1.8	7.0	2.6	2.4	5.8	5.0	36	4.2	
	Starts riots. Causes vandalism.									
Breaks relationships										
	Drinking can break up friendships / marriages / families.	1.8	0.0	2.0	0.8	1.3	1.4	11	1.3	
Smell										
	People who drink smell horrid.									
	It makes your breath smell.	1.8	1.0	2.0	0.0	0.7	0.9	9	1.0	
Total number of statements concerning the DISADVANTAGES of drinking alcohol									502	
Total number of statements concerning the ADVANTAGES of drinking alcohol									347	
(carried forward from TABLE 1)										
Total number of statements concerning the drinking of alcohol (adv. plus disadv.)									849	

Ajzen and Fishbein (1980) argue that a person can hold a large number of beliefs about a given construct, but can attend only to a relatively small number at any given moment. This 'small number' they call the salient beliefs and claim they are the immediate determinants of behaviour. The responses occurring most frequently to questions about 'advantages' and 'disadvantages' of a certain behaviour form the salient beliefs about that behaviour. It will be seen from the tables that salient beliefs vary with age. Thus the first five salient beliefs of the Year 1 pupils are:

1. Out of control.
2. Nice taste.
3. Makes you sick and ill.
4. Damages your health.                    ) equal
5. Makes you feel grown-up.        ) rank

The first five salient beliefs of Year 6 & 7 pupils are:

1. Sociable.
2. Nice taste.                                ) equal
3. Gives you confidence.                ) rank
4. Addictive.
5. Damages your health.

The average order of frequency of responses from pupils (Year 1 to Years 6 and 7) is shown in the last column of Tables A1 and A2. The beliefs occurring most frequently form the 'modal salient beliefs' of a secondary school population. The first 14 of these beliefs will encompass the 5 to 9 salient beliefs of pupils in Year 1 to Years 6 & 7 inclusively, and thus form the 'inclusive modal salient beliefs' of the total population.

***Drinking alcoholic drinks: the modal salient beliefs***

Expressed in terms of 'group identity' and in order of frequency:

1. Out of control.
2. Taste.
3. Sociable.
4. Good mood / feeling happy.
5. Damage to health.
6. Addictive.
7. Drinking and driving.
8. Makes you sick / ill.
9. Relaxing.
10. Cost. ) equal
11. Gives you hangovers. ) rank
12. Violence.
13. Confidence.
14. Feeling grown-up.

These 14 salient beliefs, expressed in the language normally used by pupils, form the Belief statements of the Alcohol Questionnaire, each one being evaluated as appropriate.

***Significant Referents***

The sources of influence cited in response to question 4 (page 4.5) were counted. Those which were cited most frequently indicated the significant referents. Table 3 which follows lists the referents cited by 161 pupils in a secondary school. The format of this table is similar to Tables 1 and 2.

## ALCOHOLIC DRINKS: SIGNIFICANT REFERENTS.

TABLE 3

Referent	Percentages of total referents mentioned.						Statements	
	Year 1 11-12yrs n=20	Year 2 12-13yrs n=28	Year 3 13-14yrs n=31	Year 4 14-15yrs n=24	Year 5 15-16yrs n=24	Year 6-7 16-18yrs n=34	No.	% of total N=441
Parents	34	50	41	36	38	33	166	38*
Friends and 'mates'	3	9	23	26	29	31	99	22*
Grandparents	22	16	12	6	6	13	54	12
Doctors	0	3	7	19	10	10	38	9
Aunts and Uncles	10	13	10	3	6	5	31	7
Siblings	21	3	2	3	0	2	21	5
Teachers	2	0	2	3	8	2	13	3
Police	0	3	2	0	0	4	7	2
T.V. and other advertising	8	0	1	0	3	0	8	2
Neighbours	0	3	1	3	0	0	4	1

Total number of statements 441

## \* Significant Referents

The significant referents to be cited in the questionnaire are marked with an asterisk\*: they are Parents and 'Friends and mates'.

### Salient beliefs and significant referents with respect to smoking cigarettes

The procedure described for the elicitation of salient beliefs and significant referents with respect to drinking alcohol were followed for smoking.

After careful piloting of different procedures, pupils were asked to respond to the following:

1. Make a list of what you think are the nice/ agreeable/ pleasant things about *smoking* cigarettes.
2. Make a list of what you think are the unpleasant/ disagreeable things and problems connected with *smoking* cigarettes.



3. Make a list of any other comments you would like to make about cigarette smoking.
4. Would anybody mind or care if you smoked?
  - a) Name those who might try and stop you from smoking.
  - b) Name those who might want you to smoke.

For smoking, 153 pupils responded. Their answers were analysed as for alcohol. However, it was more difficult to apply Ajzen and Fishbein's 'rule of thumb' to some of this set of responses. For example, consider the following, which are all about the smell associated with smoking:

The smell of cigarette smoke is horrible/unpleasant.

Cigarette smoke makes your breath smell bad.

Cigarette smoke makes your clothes smell horrible.

Cigarette smoke makes your hair smell nasty.

Cigarette smoke makes rooms / houses smell bad.

Sometimes these statements occurred singly, sometimes in twos or threes in the same sentence and sometimes in different sentences. For this reason it was decided to put all 'unpleasant smell' statements together and use a statement representing 'majority feeling' in the questionnaire, such as:

'Cigarette smoke smells unpleasant / horrible'.

Similarly, common sense decisions were made about other groups of statements.

Tables 4 and 5 which follow, set out the grouping of statements and their frequency of occurrence. The format of the tables follows that of Tables 1 and 2.

## STATEMENTS ABOUT SMOKING CIGARETTES.

TABLE 4 : ADVANTAGES.

Group Identity	Examples of statements made about the ADVANTAGES of smoking cigarettes	Percentages of total relevant statements made.						Statements	
		Age:	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5		
		11-12 yrs. n=20	12-13 yrs. n=28	13-14 yrs. n=23	14-15 yrs. n=24	15-16 yrs. n=24	16-18 yrs. n=34	No.	% of total N=661
Relaxing	Smoking relaxes people.								
	Smoking calms / soothes nerves.								
	Reduces tension and stress.	12.8	5.4	14.3	6.6	9.4	15.1	54	8.2
	Calms you down.								
Looking 'big'	Makes you look 'big'.								
	Makes you look grown-up.								
	Makes people respect you because you look older.	8.6	8.1	5.1	5.7	2.7	1.2	29	4.4
	Gives you status with friends.								
	Makes you feel grown-up.								
Sociable	Smoking is sociable.								
	Helps you break barriers in company.								
	Helps you make friends.	0.0	0.0	0.0	5.7	8.1	5.8	23	3.5
	Gives you a good chance to start a conversation.								
Occupies hands	Smoking gives you something to do with your hands.	0.0	0.0	0.0	1.9	0.0	0.6	3	0.5
Confidence	Makes you feel confident.								
	Gives you confidence.	0.0	0.0	1.1	0.0	0.7	0.0	2	0.3
Controls weight	Smoking helps you to keep your weight down.	0.0	0.9	0.0	0.0	0.7	0.0	2	0.3

Total number of statements concerning the ADVANTAGES of smoking=113  
(to be carried forward to TABLE 5)

TABLE 5 : DISADVANTAGES.

Group Identity	Examples of statements made about the DISADVANTAGES of smoking cigarettes	Percentages of total relevant statements made.							Statements No. % of total N=661	
		Age:	11-12	12-13	13-14	14-15	15-16	16-18		
		yrs. n=20	yrs. n=28	yrs. n=23	yrs. n=24	yrs. n=24	yrs. n=34			
Damages health	Damages health. Causes cancer / lung cancer / bronchitis / emphysema / coughs / heart disease.	44.7	33.0	27.5	31.0	24.2	23.1	188	28.4	
Smell	Cigarette smoke smells bad / unpleasant / nasty / horrible. It makes hair / clothes / rooms / houses / you / things smell bad.	8.5	23.2	28.6	27.4	18.1	22.4	147	22.2	
Cost	Smoking is expensive. Cigarettes cost a lot. Buying cigarettes is a waste of money.	6.4	5.4	5.5	4.7	8.7	10.9	49	7.4	
Teeth	Smoking stains your teeth.	4.3	9.0	4.4	2.8	4.3	3.2	32	4.8	
Hands and Fingers	Smoking stains your hands. Makes your fingers yellow.	4.3	6.3	5.5	2.8	2.7	5.1	31	4.7	
Addiction	Smoking is habit forming. It's hard to give up once you start smoking.	6.7	5.4	4.4	4.7	4.7	10.3	41	6.2	
Effect on others	Damages other people's health. Others shouldn't be inflicted. Annoys other people. It's selfish because it affects other people. Smoke in a room is unpleasant for non-smokers.	4.3	0.9	1.1	1.9	8.7	10.9	36	5.4	
Stunts growth	Smoking can stunt your growth. It can stop you from growing.	0.0	0.9	2.2	1.9	1.3	0.0	7	1.1	
Taste	Smoking leaves a nasty taste in your mouth.	0.0	0.0	0.0	0.9	2.0	1.9	7	1.0	
Eyes	Cigarette smoke stings your eyes Smoke makes your eyes sore.	0.0	0.9	0.0	0.0	3.4	0.0	6	0.9	
Fire hazard	Smoking can cause fires. Smoking is a fire hazard.	0.0	0.9	0.0	1.9	0.7	0.0	4	0.6	
Total number of statements concerning the DISADVANTAGES of smoking cigarettes								548		
Total number of statements concerning the ADVANTAGES of smoking cigarettes (carried forward from TABLE 4)								113		
Total number of statements concerning the smoking of cigarettes (advantages plus disadvantages).								661		

***Smoking cigarettes: the modal salient beliefs***

The modal salient beliefs about smoking, expressed in terms of 'group identity' and in order of frequency are:

1. Damages health.
2. Smell.
3. Relaxing.
4. Cost.
5. Addiction.
6. Looking 'big'.
7. Effect on others.
8. Teeth.
9. Stains hands and fingers.
10. Sociable.

These 10 salient beliefs, expressed in the language most frequently used by pupils, form the Belief statements used in the Smoking Questionnaire, each one being evaluated as appropriate.

***Significant referents***

Table 6 lists the referents cited by 153 secondary school pupils. It follows the format of Table 3.

## SMOKING: SIGNIFICANT REFERENTS.

TABLE 6

Percentages of total referents mentioned.

Referent	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-7	Statements	
	11-12yrs n=20	12-13yrs n=28	13-14yrs n=23	14-15yrs n=24	15-16yrs n=24	16-18yrs n=34	No.	% of total N=344
Parents	46	64	43	38	31	40	140	41*
Friends and 'mates'	23	28	38	28	31	29	109	32*
Doctors	0	3	2	13	3	6	13	14
Older people	5	2	4	11	8	2	16	5
Siblings	11	0	4	0	1	5	13	4
Aunts and Uncles and other relatives	0	0	2	2	12	7	17	4
Teachers	2	0	2	2	11	7	16	4
Grandparents	11	6	2	0	4	1	12	3
Smokers	0	0	4	2	0	2	5	1
Government	2	0	0	0	0	0	1	0
Neighbours	0	0	0	2	0	0	1	0
Dentist	0	0	0	2	0	0	1	0

Total number of statements 344

## \* Significant Referents

The significant referents for smoking are marked with an asterisk. They are Parents and 'Friends and mates'.

### Salient beliefs and significant referents with respect to Keeping Fit.

Before dealing with this topic, it was thought necessary to discuss with pupils what was meant by Keeping Fit. Following this discussion, an agreed definition of Keeping Fit was included on the overhead transparency listing instructions to which pupils were asked to respond as follows:

Keeping Fit - e.g. doing exercises alone such as jogging, aerobics etc. or playing sport with other people like football, hockey etc.

1. Make a list of the things which you find nice/ agreeable/ pleasant/ advantageous about keeping fit.
2. Make a list of the things which you find unpleasant/ disagreeable/ nasty about keeping fit.
- 3a. Name those who are keen for you to keep fit.
- 3b. Name those who tell you it is not important to keep fit or try to discourage you.

For Keeping Fit 148 pupils responded. The answers were again analysed as for alcohol. The following Tables 7 and 8 present the analysis of responses to questions 1 and 2 and Table 9 to questions 3a and 3b above. In this instance, information from a mixed group consisting of first and second year pupils only was obtainable. Since their precise ages were not known, the data from this group is presented together as Yrs 1 & 2. This is no problem as the final analyses of all the data were carried out in terms of categorisation by lower school (yrs 1 & 2), middle school (yrs 3 & 4) and upper school (yrs 5, 6 & 7).

## STATEMENTS ABOUT KEEPING FIT.

TABLE 7 : ADVANTAGES.

Group Identity	Examples of statements made about the ADVANTAGES of keeping fit.	Percentages of total relevant statements made.						Statements No. % of total N=849	
		Age: 11-13 yrs. n=55	Yrs 1 & 2 13-14 yrs. n=33	Yr 3 14-15 yrs. n=11	Yr 4 15-16 yrs. n=14	Yr 5 16-18 yrs. n=35	Yr 6-7		
Self image	Exercise keeps you in shape / trim / slim. Makes you look better. Gives you a nice figure / shape. Builds muscle. Improves your appearance.	9.7	14.0	17.0	14.3	9.4	63	11.8	
Intrinsic pleasure	Exercise is enjoyable / good fun. I enjoy taking exercise.	14.9	14.2	10.6	5.6	3.1	52	9.7	
How you feel	After exercising I feel good / better.	12.0	8.8	2.1	6.7	7.9	44	8.2	
Sociability	Sport is sociable. I enjoy playing with others. You meet new friends at Sports Centres. Helps you make friends. Its fun to exercise / play games with friends / others.	6.5	1.8	2.1	6.7	15	38	7.1	
Long term health	Exercise keeps you fit / healthy. Exercise helps you get healthy.	5.8	3.5	10.6	7.8	6.3	33	6.2	
Strength	Exercise makes you strong.	1.3	0.0	8.5	4.4	3.9	14	2.6	
Relieves boredom	Exercise fills your time pleasantly / relieves boredom. Gives you something to do.	3.9	0.0	0.0	5.6	0.0	11	2.1	
Achievement	I like the sense of achievement / satisfaction after exercise.	1.9	0.9	0.0	1.1	2.4	8	1.5	
Team spirit	I like the team spirit / feeling in sport.	1.3	0.0	0.0	0.0	1.6	7	1.3	
Competition	I enjoy competition in sport / games.	3.2	0.9	0.0	0.0	0.0	6	1.1	
Sleep	You sleep better if you exercise regularly.	0.0	0.0	0.0	3.3	0.0	3	0.6	
Appetite	Exercise gives you a good appetite.	0.0	0.9	0.0	2.2	0.0	3	0.6	
Total number of statements concerning the ADVANTAGES of keeping fit								311	

TABLE 8 : DISADVANTAGES.

Percentages of total relevant statements made.

Group Identity	Examples of statements made about the DISADVANTAGES of keeping fit.	Yrs 1 & 2	Yr 3	Yr 4	Yr 5	Yr 6-7	Statements	
		Age:11-13 yrs. n=55	13-14 yrs. n=33	14-15 yrs. n=11	15-16 yrs. n=14	16-18 yrs. n=35	No.	% of total N=849
Pain	After exercising your muscles / legs ache / hurt.							
	Makes you feel stiff.	9.4	10.5	10.6	1.1	8.7	42	7.8
	You get aches and pains next day.							
Tiring	Exercise is tiring / exhausting / wears you out.	7.1	7.9	6.4	6.6	6.3	36	6.7
Harmful	You can get bad injuries / hurt yourself in sport.							
	Some exercises are dangerous / cause strained muscles.	6.5	5.3	4.3	7.7	8.7	35	6.5
Foul weather	It's unpleasant / nasty to go out to games in cold / wet / rain.	5.4	5.0	0.0	2.2	0.0	22	4.1
Time-consuming	Exercising takes a lot of time / is time-consuming / is a waste of time.							
	It's difficult to find the time to exercise.	2.3	6.0	0.0	4.8	3.1	20	3.7
Hard work	Exercising is hard work / takes a lot of effort.	0.7	5.3	0.0	6.7	4.1	19	3.5
	You need to work hard to get anywhere.							
Smell / sweat	You get smelly and sweaty.							
	Sweat smells horrible.	0.0	6.0	4.3	3.3	1.6	14	2.6
Cost	It's expensive to go to Sports Centres / join clubs / pay for courts / equipment.	1.3	0.9	4.3	0.0	4.7	11	2.1
Keep it up	Once you start exercising you have to keep it up / do it on a regular basis.	0.0	0.9	4.3	2.2	1.6	7	1.3
	If you don't keep it up you get fat.							
Long term	You have to keep on exercising for a long time to feel the effect / better / improvement.	0.0	0.0	2.1	1.1	2.3	5	0.9
Rough aggressive behaviour	I don't like the rough behaviour.							
	You get beaten up in some games.	1.9	0.0	0.0	0.0	0.8	4	0.7
	Some sports / games are aggressive.							
Obsessive	People get obsessive about sport / exercise / games.	0.0	0.0	6.4	0.0	0.0	3	0.6
Lamphooning	They make fun of you / tease if you are no good at sport.	0.0	0.0	2.1	2.2	0.0	3	0.6
Total number of statements concerning the DISADVANTAGES of keeping fit							225	
Total number of statements concerning the ADVANTAGES of keeping fit							311	
(carried forward from TABLE 7)								
Total number of statements concerning keeping fit (advantages and disadvantages)							536	



***Keeping Fit: the modal salient beliefs***

The modal salient beliefs about Keeping Fit expressed in terms of 'group identity' and in order of frequency are:

1. Self image.
2. Intrinsic pleasure
3. How you feel.
4. Pains.
5. Sociability.
6. Tiring.
7. Harmful.
8. Long term health.

These 8 salient beliefs, expressed in the language most frequently used by pupils, form the Beliefs statements of the Keeping Fit Questionnaire, each one being evaluated as appropriate.

***Significant referents***

Table 9 lists the referents cited by 148 secondary school pupils. It again follows the format of Table 3.

## KEEPING FIT: SIGNIFICANT REFERENTS.

Referent	Percentages of total referents mentioned.					Statements	
	Years 1-2	Year 3	Year 4	Year 5	Year 6-7	No.	% of total
	11-13yrs n=55	13-14yrs n=33	14-15yrs n=11	15-16yrs n=14	16-18yrs n=35	N=209	
Parents	53	44	33	50	45	100	48*
Friends and 'mates'	5	14	20	22	40	37	18*
P.E. teachers, coaches and instructors	15	17	7	17	7	27	13
Teachers	8	10	7	7	7	18	9
Doctors	3	10	20	0	0	11	6
Grandparents	11	0	0	0	0	8	4
Siblings	5	5	13	0	0	9	4
Total number of statements							209

\* Significant Referents

The significant referents for Keeping Fit are Parents and 'Friends and mates'.

From Table 9 it can be seen that P.E. Teachers exert some influence on Keeping Fit. Pupils who had responded to the original questions were asked, at a later date, to clarify this influence. They indicated that it was mainly in the context of compulsory Gym and Games in school and made such comments as:

'They make you do it even if you are not well.'

'You have to go out in all weathers.'

'It's hard to get out of games at school.'

Statements such as these imply *institutional compulsions* rather than social pressures to behave in particular ways when subjects are in situations where they are free to do so. They do not therefore comply with the spirit of Ajzen and Fishbein's 'significant referents', and P.E. teachers

were not therefore included as significant referents in the questionnaire.

**Salient beliefs and significant referents with respect to diet.**

The following information and requests were presented to pupils:

Eating a healthy diet

The experts say that each day we should eat:

1. Some protein (meat/ fish/ eggs/ cheese/ beans etc.)
  2. Some fresh fruit and fresh green vegetables or salad.
  3. Some carbohydrate like bread and potatoes but not too much sugar.
  4. Some fibre as found in wholemeal brown bread, rice, pasta or cereals (bran).
  5. Not too much salt.
  6. Not too much animal fat (butter, cream, bacon, sausages, burgers, chips, fried food).
- i) Now take each of the above words underlined and say what you think about eating that food.

eg. I like eating \_\_\_\_\_ because...

I hate eating \_\_\_\_\_ because...

I think I should eat \_\_\_\_\_ because...

I shouldn't eat \_\_\_\_\_ because... etc.

USE YOUR OWN WORDS.

- ii) Name those who:

- (a) worry about what you eat and try to make you eat a healthy diet/ food;
- (b) get you to eat food that is not good for you.

The 'experts' referred to are those responsible for the NACNE Report (1983).

The analysis of the responses was found to be problematic, since Ajzen and Fishbein's (1980) 'advantages' and 'disadvantages' of eating particular food were not expressed clearly. The tables for Diet are therefore presented in a different form. Statements starting:

I like eating ...

I usually eat ...

I should eat ...  
etc.

were regarded as being advantages of eating a particular food. Statements starting:

I hate eating ...

I do not like eating ...

I think \_\_\_\_\_ tastes horrible.

I don't eat much \_\_\_\_\_ because ...

were regarded as being disadvantages of eating a particular type of food. Statements such as:

'I hate greens but I eat them because they are good for me.'

were added to both the advantageous statements and disadvantageous statements concerning eating that particular food, since the pupils were experiencing a dilemma.

Indifferent statements such as:

'It's OK if there's nothing else'

'I suppose it's alright if you are hungry'

were not counted.

For Diet, 166 pupils responded. Their answers were analysed

as described as above. The detailed analysis is presented in the Table 10 in terms of:

- i) advantages;
  - ii) disadvantages
- of eating certain types of foods.

#### EXAMPLES OF STATEMENTS ABOUT EATING PARTICULAR TYPES OF FOOD.

TABLE 10: ADVANTAGES AND DISADVANTAGES.		Percentages of total statements		(i) advantageous; (ii) disadvantageous; to do with different types of food.			
		Yrs 1 & 2 n=46		Yrs 3 & 4 n=60		Yrs 5 to 7 n=60	
Examples of statements made about eating particular types of food.		(i)	(ii)	(i)	(ii)	(i)	(ii)
Protein	Advantages:						
	I like eating protein because it is tasty / filling / helps you grow / good for you.						
	I enjoy eating protein.	84		80		100	
	Disadvantages:						
	I think fish is horrible.						
	I don't like eggs / cheese.						
	Health food beans are boring.		16		20		0
Fresh fruit	Advantages:						
	I like the taste of fruit.						
	It helps to keep you healthy.						
	It is tasty / refreshing.						
	I like the variety.	90		96		90	
	Disadvantages:						
	I don't like to eat / hardly ever eat fruit because I don't like the taste.		10		4		10
Greens and salads	Advantages:						
	Greens / salads are tasty / have a good flavour.						
	They are good for you.						
	Salads are good for dieting.						
	They keep you healthy.	32		29		64	
	Disadvantages:						
	Greens and salads are not nice / taste nasty / don't fill you up.						
	Greens don't look nice.		68		71		36
Sugar	Advantages:						
	I love the taste of sweet food.						
	I have a "sweet tooth".						
	Sugar is tasty / gives you energy / is nice.						
	Sugar makes food taste better.	63		70		37	
	Disadvantages:						
	Too much sugar is bad for you / fattening / damages your teeth.		37		30		63

TABLE 10: ADVANTAGES AND DISADVANTAGES.  
(continued)Percentages of total statements  
(i) advantageous;  
(ii) disadvantageous;  
to do with different types of food.

		Yrs 1 & 2 n=46		Yrs 3 & 4 n=60		Yrs 5 to 7 n=60	
Examples of statements made about eating particular types of food.		(i)	(ii)	(i)	(ii)	(i)	(ii)
Fibre	Advantages:						
	You should eat fibre because it's good for you.						
	Fibre is roughage and helps your digestion.						
	Fibre is nice / chewy.						
	Brown bread is nutty / nice.						
	Fibre is wholesome and good for you.	25		28		47	
	Disadvantages:						
	Brown bread doesn't taste nice.						
Salt	Brown bread / bran is hard to eat because it's dry.						
	Bran is boring /uninteresting / tastes foul.		75		72		53
	Advantages:						
	Salt makes food / chips / potatoes taste better.						
Animal fats	Salt is spicy / tasty / flavoursome.	25		34		50	
	Disadvantages:						
	Salt tastes revolting / ruins a meal / is horrible.						
	I don't like salt because I don't like the taste.		75		66		50
Animal fats	Advantages:						
	I love the taste of butter / cream / fried foods / chips.						
	Fats are filling.						
	Fried food is "fast" (to prepare) and good to eat.						
	Butter / sausages / burgers / chips are tasty.	63		70		44	
	Disadvantages:						
	I don't like the taste of greasy food.						
	I hate fat meat like pork.						
Milk	Fatty food is fattening / gives you spots / gives you heart trouble / is bad for you.		37		30		56
	Advantages:						
	I love milk because it has a good taste.						
	Milk is refreshing /good for you.	65		72		51	
Milk	Disadvantages:						
	I think milk is bad for you if you have too much.						
	Milk makes you fat.						
	I don't like the taste of milk.		35		28		49

**Analysis comments**

Protein	Generally high proportion of favourable beliefs about eating proteins. A few do not like fish.
Fresh fruit	Generally high proportion of favourable beliefs about eating fresh fruit. A few said they did not eat enough (possibly due to availability?).

Salad/Greens	A high proportion of unfavourable beliefs about eating greens/salads from younger pupils. As they get older, the proportion of favourable statements about eating greens / salad increases.
Sugar	A high proportion of favourable beliefs from younger pupils, with respect to eating sugar. Older pupils beliefs about eating sugar are more unfavourable.
Fibre	A high proportion of unfavourable beliefs about eating fibre from younger pupils. Older pupils (5th, 6th, 7th years) have more favourable beliefs about eating fibre.
Salt	The proportion of favourable beliefs increases with age, with respect to eating salt.
Animal fat	A high proportion of favourable beliefs about eating fatty food from younger pupils. Older pupils (5th, 6th, 7th) have less favourable beliefs about fatty food.

Thus it can be seen that beliefs are changing with age and rather more than Ajzen and Fishbein's nine 'salient beliefs' will need to be incorporated into the final questionnaire, to give a wide range of options.

Further analysis of the statements was required to extract *salient beliefs*, since in the analysis depicted in Table 10, statements which were not salient beliefs were included, e.g.:

I like/ dislike/ love/ hate/ can't stand certain types of food.

or

Food X is nice/ horrible etc.

These are evaluations of the food, without reasons. These solely evaluatory statements were discounted, and an analysis of salient beliefs then carried out. Statements 'in favour' of eating a particular type of food were categorised as 'advantages' and statements 'against' eating

certain types of food as 'disadvantages'. Please see Tables 11 to 18 which follow.

TABLE 11: STATEMENTS ABOUT EATING PROTEIN.

Examples of statements about the advantages and disadvantages of eating protein, made by 166 pupils.		Statements (n=174)	
		no.	% of total
Advantages & Taste	I like the flavour / taste of protein.		
	It has a nice taste.		
	Protein is tasty.		
	I hate the taste of fish / eggs / cheese.		
	I eat a lot of protein because I like the taste.	78	45%
Advantages	Good for you		
	Protein is good for you / keeps you fit / keeps you healthy / is nourishing.	34	20%
Advantages	Filling		
	Protein fills you up.		
	I like protein because it's filling.		
	I eat protein because it fills you up and you don't feel hungry afterwards.	24	14%
Advantages	Growth & repair		
	I eat a lot of protein because I need it to grow.		
	It is essential for growth and repair.		
	Protein is necessary for growth and body building.	24	14%
Advantages	Versatile		
	I like the variety in protein, you can cook it in all sorts of ways.		
	It's a versatile sort of food.	4	2%
Advantages	Energy		
	I eat protein to give me energy.		
	Protein gives you energy.	4	2%
Advantages	Essential		
	Protein is essential to life / one of the essential foods.	4	2%
Advantages	Cheap		
	Some proteins are cheap foods.	2	1%
Total number of statements.		174	



TABLE 12: STATEMENTS ABOUT EATING FRESH FRUIT.

Examples of statements about the advantages and disadvantages of eating fresh fruit, made by 166 pupils.		Statements (n=177)	
		no.	% of total
Advantages & Taste	Fruit has a lovely taste.		
	I like its sweet taste.		
	It has a refreshing taste.		
	It tastes sour / horrible.	92	52%
Advantages	Good for you		
	Fruit is good for me / keeps me healthy.		
	It keeps you healthy because it contains vitamins		
	You must eat fruit to keep healthy.	44	25%
Advantages	Low in calories		
	I eat a lot fruit because it is low in calories.		
	It's a good diet food.		
	Fruit is not fattening.	24	14%
Advantages	Teeth		
	Apples are good for your teeth.	4	2%
Advantages	Juicy		
	I like juicy fruit because it refreshes me.	4	2%
Advantages	Energy		
	Fruit gives you energy.	2	1%
Advantages	Variety		
	I like the variety in fruits.	2	1%
Advantages	Fibre		
	Fruit gives you fibre.	1	0.5%
Total number of statements.		177	

TABLE 13: STATEMENTS ABOUT EATING GREEN VEGETABLES AND SALADS.

Examples of statements about the advantages and disadvantages of eating green vegetables and salads, made by 166 pupils.		Statements (n=133) no.            % of total	
<hr/>			
Advantages & Taste			
disadvantages	Greens / salads add flavour to a meal.		
	They are tasty.		
	I like the taste.		
	They taste nasty / horrible.		
	I hate the taste.	60	45%
<hr/>			
Advantages	Good for you		
	Greens / salads are good for us / keep us fit and healthy.		
	They are good for your health.		
	They are good for you because they give you vitamins / roughage.	39	29%
<hr/>			
Advantages	Low in calories		
	Greens and salads are good "diet" foods.		
	They are good for slimmers / contain few calories.		
	They fill you up when you are on a diet.	20	15%
<hr/>			
Advantages	Easy to prepare		
	Salads are easy to prepare.		
	You don't have to cook when you have salads.	4	3%
<hr/>			
Disadvantages	Appearance		
	I don't like the look of greens.		
	Greens look horrible.	4	3%
<hr/>			
Advantages	Fibre		
	Greens and salads give you fibre.	3	2%
<hr/>			
Disadvantages	Nauseous		
	Greens / salads make me feel sick / ill.	3	2%
<hr/>			
Total number of statements.		133	

TABLE 14: STATEMENTS ABOUT EATING SUGAR AND SWEET FOODS.

Examples of statements about the advantages and disadvantages of eating sugar and sweet foods, made by 166 pupils.		Statements (n=131)	
		no.	% of total
<hr/>			
Advantages & Taste			
disadvantages	I love the taste of sweet foods.		
	Sweets / sugar taste good.		
	Sugar improves the flavour of things.		
	Sugar / sweet things taste nice.		
	I don't like the taste of very sweet foods.		
	Sugar hides the flavour of foods.	51	38%
<hr/>			
Disadvantages	Teeth		
	Sugar rots your teeth.		
	Sweets are bad for your teeth.	34	26%
<hr/>			
Disadvantages	High in calories		
	Sugar / sweets are bad for slimmers.		
	Sugar / sweets / sweet food is fattening.		
	Sugar makes you fat.	30	23%
<hr/>			
Disadvantages	Damages your health		
	Too much sugar is bad for your health / can cause heart attacks.	6	5%
<hr/>			
Advantages	Energy		
	Sugar and sweet foods give you energy.	6	5%
<hr/>			
Disadvantages	Nauseous		
	Sweet things make me feel sick.	2	2%
<hr/>			
Disadvantages	Acne		
	Sweet foods give me spots.	2	2%
<hr/>			
Total number of statements.		131	

TABLE 15: STATEMENTS ABOUT EATING FIBRE - BRAN, WHOLEMEAL BROWN BREAD, PASTA AND RICE.

Examples of statements about the advantages and disadvantages of eating fibre - bran, wholemeal brown bread, pasta, and rice, made by 166 pupils.		Statements (n=134) no.            % of total	
<hr/>			
Advantages & Taste			
disadvantages	Brown bread / bran etc. has a horrible / nasty taste.		
	Wholemeal bread etc. has a good taste / nice nutty flavour.		
	Wholemeal cereals are tasty.	45	34%
<hr/>			
Advantages	Good for you / good for your digestion		
	Fibre is good for you / good for your health.		
	Fibre helps the digestive system.		
	Fibre is essential for the digestive system.		
	I only eat it because it's good for me.		
	I know it's good for me, but I hate it and don't eat it often.	45	34%
<hr/>			
Disadvantages	Hard to swallow		
	Fibre is dry and hard to swallow.		
	Brown bread is too dry and it is difficult to eat.		
	It's horrible and dry and sticks in your throat.	32	24%
<hr/>			
Disadvantages	Boring		
	Brown bread / fibre etc. is boring to eat.	5	4%
<hr/>			
Disadvantages	Too heavy		
	Brown bread / fibre etc. are too heavy to eat.	3	2%
<hr/>			
Advantages	Non fattening		
	Fibre is non fattening / good for slimmers.	2	1%
<hr/>			
Advantages	Vitamins		
	Wholemeal foods contain vitamins.	2	1%
<hr/>			
Total number of statements.		134	

TABLE 16: STATEMENTS ABOUT EATING SALT

Examples of statements about the advantages and disadvantages of eating salt, made by 166 pupils.		Statements (n=108)	
		no.	% of total
<b>Advantages &amp; Taste</b>			
disadvantages	Salt spoils the taste of food.		
	Salt gives food flavour.		
	Salt is flavoursome / makes food taste nice.		
	Food doesn't taste without it.		
	I don't like the taste of salt.		
	Salt ruins the taste / tastes horrible / improves the flavour of food.	83	77%
<b>Advantages &amp; Good / bad for you</b>			
disadvantages	Salt is essential for your health.		
	Salt is good for you.		
	Salt is bad for your health / bad for you.		
	Salt can give you 'blood pressure' (high).		
	Too much salt gives you heart trouble / makes you retain water.		
	Salt makes you thirsty / dehydrated.	25	23%
Total number of statements.		108	

TABLE 17: STATEMENTS ABOUT EATING FATTY FOODS

Examples of statements about the advantages and disadvantages of eating fatty foods, made by 166 pupils.		Statements (n=109)	
		no.	% of total
<b>Advantages &amp; Taste</b>			
disadvantages	I love the taste of chips / burgers / sausages / fried foods.		
	Fried foods have a good flavour / are tasty.		
	I hate the taste of greasy fatty foods.		
	Fatty foods taste disgusting.		
	I love the taste of butter.	67	61%
<b>Disadvantages Fattening</b>			
	Fatty foods are fattening / bad for slimmers / bad for dieters.		
	Fats are high in calories.	20	18%
<b>Disadvantages Effect on heart</b>			
	Too much fat can give you heart attacks.		
	Cholesterol blocks your arteries.		
	Fat is bad for your heart.	19	17%
<b>Disadvantages Feel</b>			
	Fatty foods are slimy.	3	3%
Total number of statements.		109	

TABLE 18: STATEMENTS ABOUT DRINKING MILK

Examples of statements about the advantages and disadvantages of drinking milk, made by 166 pupils.		Statements (n=89)	
		no.	% of total
<b>Advantages &amp; Taste</b>			
disadvantages	I love milk, it has a good taste.		
	Milk has a nice creamy taste / a refreshing taste.		
	I hate the taste of milk.	42	47%
<b>Advantages &amp; Good for you / bad for you</b>			
disadvantages	Milk is good for your health / keeps you fit.		
	You should drink milk because it's good for you.		
	You should only have skimmed milk, the fat is bad for you.		
	Too much milk can cause heart attacks.	38	43%
<b>Disadvantages Fattening</b>			
	Milk is fattening / makes you fat.		
	Milk is bad for dieters / slimmers / 'diets'.	6	7%
<b>Advantages Energy</b>			
	Milk gives you energy.	3	3%
Total number of statements.		89	

***Diet: the modal salient beliefs***

On inspection of Tables 11 to 18, with the exception of Table 16 (Salt), where there were only two groups of statements, there appeared in every case to be a level at which the percentage of statements made about a particular advantage or disadvantage (last column) fell away sharply. This was designated the point of cut off for inclusion of statements in the questionnaire. These 'cut off' points are as follows:

Statements about eating:	'Cut-off' point
Protein	14%
Fresh fruit	14%
Green vegetables & salads	15%
Sugar and sweet foods	23%
Bran & wholemeal foods	24%
Fatty foods	43%

**Significant referents**

Table 19 lists the referents cited by 166 secondary pupils.

**DIET: SIGNIFICANT REFERENTS.**

Referent	Percentages of total referents mentioned.			
	Years 1-2 11-13yrs n=46	Year 3-4 13-15yrs n=60	Years 5-7 15-18yrs n=60	Statements No. % of total N=166,
Parents	75	57	55	52 61*
Grandparents	10	23	5	10 12
Friends and 'mates'	0	11	9	9 11
Doctors	5	5	5	4 5
Teachers	0	2	14	4 5
Dentists	0	2	0	1 1
Advertisers	0	0	14	3 3
-----				
Total number of statements 166				

**\* Significant Referents**

The significant referents for Diet are Parents, pupils mentioning mothers more often than fathers.

Referents perceived by pupils to be encouraging them to eat a healthy diet include: parents; approximately half the grandparents; teachers; doctors; dentists.

Referents perceived by pupils to be encouraging them to eat things which are 'bad' for them include: the school (you can't buy a good balanced meal when you are at the end of the dinner queue); advertisers; friends (they encourage you to eat sweets / snacks and chips down at the 'chippy'); approximately half of the grandparents were cited as encouraging youngsters to eat food that is 'bad' for them, often against their parents wishes (my gran / grandad always gives me sweets / fizzy drinks / chips etc.).

## DEVELOPING THE QUESTIONNAIRES

### Constructing the draft questionnaires

A first draft questionnaire on Alcohol (ALC1) was constructed and tried out. Insights gained were then applied to the construction of the first drafts of the Smoking (SM1), Keeping Fit (KF1) and Diet (D1) questionnaires (see Appendix 02). Detailed reference is made in this chapter to the development of the Alcohol questionnaire only, since it typifies the approach used for the Smoking, Keeping Fit, and some aspects of the Diet questionnaires. Other aspects of the development of the Diet questionnaire will be dealt with additionally, since it has a slightly different format.

Each questionnaire consists of three parts:

1. Questions about Intentions.  
(Alcohol Draft Questionnaire - ALC1 No.1 to 3)
2. Salient Beliefs and their outcome evaluations.  
(ALC1 No. 4 to 17)
3. Normative Beliefs and the respondent's motivation to comply with particular significant referents.  
(ALC1 No. 18 to 25)

### *Scaling of the questionnaire responses*

Ajzen and Fishbein (1975, p.309 and 1980, p.42 and pp.66 to 71) suggest that all scales should be scored from -3 to +3, a scale range of seven points. Scale ranges of 7 points were felt to be too finely calibrated for measuring and evaluating the salient beliefs of secondary school pupils, which appeared generally to be less finely discriminated. Thus, it was decided to use a five point scale, i.e. from -2 to +2. Similarly the responses used in this study are a simplified form of those proposed by Ajzen and Fishbein (1980 Appendix A p.261).



### Intentions items

Ajzen and Fishbein (1980, p 42) state, 'To predict a behavioral criterion from intention, it is essential to ensure that the measure of intention corresponds to the measure of behavior. Like behaviors, intentions can be viewed as consisting of action, target, context, and time elements. Intention and behavior correspond to the extent that their elements are identical'. The Intention statements used in the questionnaires therefore contain at least three of these elements.

### *Alcohol (Smoking, Keeping Fit)*

The elicitation of Intentions with respect to Alcohol is described in Chapter 4, pages 4.1 and 4.2. An example of a typical Intention statement is as follows. The scoring is placed in brackets beneath the responses in these examples: it did not appear in the actual questionnaires, of course.

- 1) Do you think you will drink alcoholic drinks at home with your family in the next month?
- |               |            |            |                |                  |
|---------------|------------|------------|----------------|------------------|
| definitely no | - unlikely | - not sure | - quite likely | - definitely yes |
| (-2)          | -1         | 0          | +1             | (+2)             |
- (ALC1)

### *Diet*

The elicitation of the Intentions of the target population with respect to diet are described in Chapter 4 pages 4.3 and 4.4. A Diet questionnaire was prepared (draft scale: Diet D1). The intention items were phrased as follows:

In the next two days I think I will eat:

- 1) Some protein (e.g. meat, fish, cheese, eggs, beans);
- |               |            |            |                |                  |
|---------------|------------|------------|----------------|------------------|
| definitely no | - unlikely | - not sure | - quite likely | - definitely yes |
| (-2)          | -1         | 0          | +1             | (+2)             |
- 2) Some fresh fruit;
- |               |            |            |                |                  |
|---------------|------------|------------|----------------|------------------|
| definitely no | - unlikely | - not sure | - quite likely | - definitely yes |
| (-2)          | -1         | 0          | +1             | (+2)             |

3) Some salad or fresh green vegetables;  
definitely no - unlikely - not sure - quite likely - definitely yes  
(-2)                      -1                      0                      +1                      +2)  
etc.,

(D1)

The foods included were both the 'desirable' and 'undesirable' elements of the diet mentioned in the NACNE Report (1983). Milk and crisps were included because the reporters in 'World in Action' (ITV programme on diet, Feb. 84) suggested that young people consume large quantities of crisps and milk, both of which have a high fat content and in consequence are undesirable. Two days was thought to be a reasonable time-span, having regard for the regular intake of food types mentioned in the NACNE Report (1983).

### Salient beliefs and their outcome evaluations

### *Alcohol (Smoking, Keeping Fit): Salient Beliefs*

It was found that the salient beliefs of pupils varied with age. In order to accommodate the beliefs of the age groups to be included in the study, 14 'belief items', with respect to Alcohol, were required rather than Ajzen and Fishbein's (1980) 5 - 7 beliefs (Chapter 4 pages 4.10 and 4.11).

## Scaling 'strength of belief'

Two different approaches to scaling the strength of belief are suggested by Ajzen and Fishbein (1980, p.67). Considering the belief, 'Taking the birth control pill causes me to gain weight', i.e. a Salient Belief concerning the use of the birth control pill, they suggest that the strength of belief might be measured:

(a) on a 0 to +3 scale as follows:

'How certain are you that birth control pills  
cause you to gain weight?'

not at all certain	0
slightly certain	+1
quite certain	+2
extremely certain	+3

or alternatively:

(b) on a +3 to -3 scale:

'Using the birth control pill causes me to gain weight'

Likely				neither/nor			Unlikely
extremely	quite	slightly			slightly	quite	extremely
+3	+2	+1	0	-1	-2	-3	

It was decided to use type (b) scale, following the example of Ajzen and Fishbein (1980 Appendix A op cit.), but using a five point scale rather than a seven.

### ***Scaling outcome evaluations***

The evaluation of the belief might be measured:

Causes me to gain weight

Good				neither/nor			Bad
extremely	quite	slightly			slightly	quite	extremely
+3	+2	+1	0	-1	-2	-3	

(Ajzen and Fishbein 1980, p.66)

As stated above, Ajzen and Fishbein suggest that the evaluation scale should be bi-polar, good to bad. Marsh and Matheson (1983), however, evaluating beliefs about smoking state: 'The evaluation part was measured by asking smokers if they 'wanted' or 'feared' each outcome, since one cannot ask sensible people how much they want lung cancer and expect them to take one seriously'. Applying this notion to the present study, consider the evaluation of 'being sick and ill' (a disadvantage of drinking alcohol). This statement cannot sensibly be evaluated on a good - bad scale, as suggested by Ajzen and Fishbein (1980), e.g.:

'Being sick and ill is a:

very good      good      not sure      bad      very bad  
thing.'

More reasonable ways evaluating this outcome might be:

'How much do you fear being sick and ill?'

or

'How serious a matter is it to you to be sick and ill?'

not at all serious +2	not serious +1	not sure 0	quite serious -1	extremely serious -2
-----------------------------	----------------------	------------------	------------------------	----------------------------

Therefore evaluatory statements in the questionnaires were made to comply with common sense, e.g.:

4) Alcoholic drinks calm your nerves and help you to relax.

strongly disagree - disagree - not sure - agree - strongly agree  
(-2      -1      0      +1      +2)

How important is it to be calm and relaxed?

not at all important - not very important - not sure - quite important - extremely important  
(-2      -1      0      +1      +2)

5) People should not drink and drive.

strongly disagree - disagree - not sure - agree - strongly agree  
(-2      -1      0      +1      +2)

How dangerous do you think it is to drink and drive?

not at all dangerous - not very dangerous - not sure - quite dangerous - extremely dangerous  
(+2      +1      0      -1      -2)

(ALC1)

### ***Diet: Salient Beliefs and their evaluation***

The salient beliefs of the target population with respect to diet are discussed in Chapter 4 page 4.34. It will be seen that a salient belief concerning taste occurs for each type of food in the analysis (Tables 11 to 18). It was decided that the beliefs about taste should be put together in a group in the questionnaire (see Diet Questionnaire D1, No. 11 to 20), e.g.:

What do you think of the taste of the following foods?

11) Green vegetables;

horrible - not very nice - not sure - quite nice - extremely nice  
(-2      -1      0      +1      +2)

12) Foods like chips, sausages, beef burgers, pies etc.;  
 horrible - not very nice - not sure - quite nice - extremely nice  
 (-2                      -1                      0                      +1                      +2)

13) Salad;  
 horrible - not very nice - not sure - quite nice - extremely nice  
 (-2                      -1                      0                      +1                      +2)

etc.. (D1)

This method was chosen in preference to;

'Green vegetable taste horrible'

strongly disagree \_\_\_\_\_ strongly agree

because opinion, with respect to the taste of green vegetables, was divided and it was thought that pupils should have opportunity to express favourable views about greens rather than merely 'strongly disagreeing' with the statement: 'Green vegetables taste horrible'.

One outcome evaluation was then included at the end of the group of 'beliefs' about taste: (item no. 21)

21) How important is it to you to eat food that you like the taste of?

not at all - not very much - not sure - quite a lot - very much  
 (-2                      -1                      0                      +1                      +2)

(D1)

Items No. 22-34 represent the remainder of the salient beliefs and their outcome evaluations. Beliefs about proteins were put together (items no. 22 - 23) and so on with fresh fruit, greens and salads, etc.

### **Normative beliefs and motivation to comply**

#### ***Alcohol (Smoking, Keeping Fit)***

For Alcohol, the significant referents were found to be 'parents' and 'friends and mates'. The phrase 'friends and other young people' was used in the questionnaires to avoid the potential (sexual) ambiguity of the word 'mates'. Normative beliefs were investigated by taking each

'intention' statement in turn and asking if parents would approve of each particular behaviour. This procedure was repeated for friends (ALC1 No. 18 to 20 and 22 to 24), e.g.:

- 18) Would your parents think it's alright for you to drink alcoholic drinks at home with the family in the next month?

definitely no - probably no - not sure - probably yes - definitely yes  
 (-2                    -1                    0                    +1                    +2)

(ALC1)

Motivation to comply was investigated by items No. 21 and 25, e.g.:

- 21) Generally speaking, how much do you want to do what your parents think you should do?

hardly at all - a little - not sure - quite a lot - very much  
 (-2                    -1                    0                    +1                    +2)

(ALC1)

### **Diet**

Taking each of the diet Intention statements in turn, and asking if parents would approve or disapprove of the behavior would yield:

"My parents think that I  
 should<----->should not  
 eat protein foods in the next two days".  
 and so on for each type of food.

This approach was tried with a small group of 3rd year pupils who were highly critical: they said that "... all the questions seemed the same" and "... it was a waste of time." Furthermore they said they were not sure of the views of their parents with respect to each type of food.

Thus, normative beliefs and motivation to comply were investigated by items No. 35 and 36 in the Draft Scale: Diet D1:

- 35) Do your parents try to persuade you to eat certain kinds of food?

definitely no - unlikely - not sure - quite likely - definitely yes  
 (-2                      -1                      0                      +1                      +2)

- 36) How much do you want to do what your parents want you to do?

not at all - not very much - not sure - quite a lot - extremely  
 (-2                      -1                      0                      +1                      +2)

(D1)

A title page giving instructions about completing the questionnaires and practice examples was prepared for use when piloting all the questionnaires. A copy of this page appears as Appendix (03)

#### **Piloting the draft questionnaires and developing a final version of each one**

After the first draft questionnaires for Alcohol (ALC1), Smoking (SM1), Keeping Fit (KF1) and Diet (D1) had been constructed as described, each was piloted and revised through several subsequent drafts. The final versions of the four questionnaires and the title page are included as Appendix 05 and 06.

For other types of attitude measures, e.g. Likert, Thurstone, Guttman, there is an established routine for scale development, including scoring of responses. There is a great deal of vagueness and confusion evident, both in the writings of Fishbein and Ajzen (1975) and Ajzen and Fishbein (1977 and 1980) and subsequent users of their model, about how to express items and responses and how to score them. The major purpose of the piloting was to refine the questionnaires by taking account of what the pupils had to say about them in terms of: instructions; format; language and length. Different ways of scoring the questionnaires were also tried out at the same time, since, as noted above,

there is no consensus in the literature as to how this should be done. A summary of the way in which the final scales were scored is given on page 7.6.

Details of the further refinement of the questionnaires and the title page are given in Appendix 04. The development of the Alcohol questionnaire only is described, since this typifies the approach used in the Smoking, Keeping Fit, and many aspects of the Diet questionnaires. Again, other aspects of the Diet questionnaires are dealt with additionally. Development is described under three headings:

- (i) Format;
- (ii) Language;
- (iii) Responses and scoring.

#### **Collating the questionnaires and submitting them to a trial run**

##### ***Collation of the questionnaires***

At the end of the piloting with small groups of pupils, it was possible to put together questionnaires for each of the four topics which had:

- (i) a clear and interesting format;
- (ii) unambiguous language;
- (iii) satisfactory responses and scoring.

Ideally in this study it would have been preferable for each pupil to complete all four questionnaires in order to:

- (i) obtain the maximum data from the minimum number of pupils;
- (ii) investigate inter-topic correlation in order to test the conclusions of earlier work (see Appendix 01), which had indicated that adolescents do not have an integrated concept of health behaviour, but rather have beliefs and experience social pressures concerning particular aspects of health behaviour.



Piloting had shown however, that the time required by most pupils to complete all four questionnaires would be 40 to 45 minutes. In order to maintain the anonymity considered necessary for frank and honest answers, pupils would have to answer all four questionnaires at one sitting. Younger and less able pupils could not be expected to concentrate fully for so long and might well treat the later questionnaires superficially as a consequence.

Nevertheless, it was thought that provision ought to be made for testing the inter-topic relationships in this survey (although some correlation might be expected, of course, due to the common format of the questionnaires). The most economical means of allowing for this was to collate the questionnaires in pairs. Thus, each pupil would be tested on their Intentions, Beliefs and the Social Pressures they experience in relation to two aspects of health behaviour. Hence, systematically paired and presented questionnaires were completed by each age group in each school.

### ***The systematic pairing and presenting of questionnaires***

The twelve possible combinations of two questionnaires selected from the four is:

Alcohol	with	Smoking	(AS)
Alcohol	with	Keeping Fit	(AK)
Alcohol	with	Diet	(AD)
Smoking	with	Alcohol	(SA)
Smoking	with	Keeping Fit	(SK)
Smoking	with	Diet	(SD)
Keeping Fit	with	Alcohol	(KA)
Keeping Fit	with	Smoking	(KS)
Keeping Fit	with	Diet	(KD)
Diet	with	Alcohol	(DA)
Diet	with	Smoking	(DS)
Diet	with	Keeping Fit	(DK)

The questionnaires were stapled together in these pairs, the first mentioned being on top. To each pair was then attached a cover page containing the title and instructions. For easy identification, questionnaires were printed on coloured paper, as follows:

Alcohol questionnaire	- pink paper;
Smoking questionnaire	- blue paper;
Keeping Fit questionnaire	- green paper;
Diet questionnaire	- yellow paper.

The title page was printed on white paper.

The questionnaires were bundled in sets of twelve, as above and distributed for administration to the survey schools.

### ***The trial run***

Before printing sufficient questionnaires for the full survey it was decided to do a 'trial run' in one comprehensive school with three groups of pupils, one from each of the Lower, Middle and Upper schools. Each group consisted of approximately 25 pupils. Each pupil completed two questionnaires, thus yielding approximately 150 (75x2), i.e. approximately 37 (150/4) of each type. The author personally supervised the administration of this trial run. The questionnaires were completed in the formal setting of a science department, by pupils who knew her. They were from middle and upper ability bands: no pupils from lower ability bands were included.

The purposes of the trial run were:

- (i) to identify any final problems with format, language, scoring and timing emerging when pupils were working in a formal setting of a large group, lacking the intimate and personal supervision of the piloting;

- (ii) to confirm that the data collected were compatible with the proposed analysis procedures.

### ***Identifying problems in presentation***

The language and timing were satisfactory. On scoring it was found that a number of pupils had failed to respond to one or more items, thus the following change in the format was made. A note was added to the end of each questionnaire, e.g. for the Alcohol questionnaire:

NOW PLEASE CHECK THAT YOU HAVE PUT A CIRCLE ROUND 39 WORDS ON THIS PINK QUESTIONNAIRE.

Scoring itself presented no problem: in the final draft provision was made on each questionnaire for computer coding of the scale (Alcohol, Smoking etc.), the scoring of the items and on the title page, for computer coding of subject identifiers. The final versions of the questionnaires are included in Appendix 05.

### ***Trying out analysis procedures***

The second purpose of this trial run was to confirm that the data were compatible with the proposed analysis procedures and to work out a routine of combinations and recoding of the data to comply with the requirements of the Ajzen and Fishbein Model. This routine is detailed in the description of the analysis of the main survey which follows (Chapter 8). The author entered the data from the Alcohol questionnaires into a computer file 'by hand'. Regression Analysis was then used to investigate the relative importance of Beliefs and Social Pressures (i.e. the independent variables) in determining the Intentions (i.e. the dependent variable).

Table 20: Results of the regression analysis (n = 34)

---

	Intentions to drink alcohol
Beliefs about drinking alcohol	$r = 0.78$
Social Pressures concerning drinking alcohol	$r = 0.55$
	Multiple $R = 0.82$
	Multiple $R^2 = 0.67$

---

i.e. 67% of the variance in Intentions is explained by variance in Beliefs and Social Pressures. This was considered to be a very satisfactory result, being similar in magnitude to the results reported by other workers (see pages 2.14 and 2.15). It indicated that the questionnaires were suitable for use with the adolescents for whom they had been developed and that the Ajzen and Fishbein model appeared to be internally valid when applied in this context. It was decided therefore to go ahead with the printing of sufficient questionnaires for the main survey.

## RELIABILITY AND VALIDITY

Fishbein and Ajzen (1975, p.107) state 'The concepts of reliability and validity concern the degree to which the measuring instrument is free of measurement error.'

The classical test theory model (Nuttall 1979, p.63) postulates:

$$O = T + E$$

Where:       $O$  = Observed score on a test  
                $T$  = True score on a test  
                $E$  = Error score

Fishbein and Ajzen suggest that the error component can be further divided into two parts:

$E_v$  = variable or random error, and...  
 $E_c$  = constant error.

Thus       $O = T + E_v + E_c$

Reliability refers to the degree to which a measure is free from variable error ( $E_v$ ). Thus, assuming the true score ( $T$ ) remains constant (e.g. the subject's attitude has not changed), a perfectly reliable instrument will give the same score on different occasions. Variable factors such as the person's mood, the weather, the testing situation, the test administrator, may have effect on responses (giving  $E_v$ ) thereby reducing the reliability of the instrument.

Nuttall (1979, p.48) defines validity as 'the extent to which the instrument measures what it purports to measure'. Fishbein and Ajzen (1975, p.108) state that 'validity refers to the degree to which an instrument measures the true score, in the present context, the degree to which it measures a given belief, attitude or intention rather than

some other variable'. The presence of constant error (Ec) will reduce the validity of measures, since the observed score will be contaminated by some irrelevant factor(s). A potential source of constant error (Ec) is 'response bias': some subjects may tend to give socially desirable responses rather than responses reflecting their own personal beliefs, others may avoid using the extreme categories of the scale even though they might feel extreme. Response sets, i.e. the tendency to answer in a certain way regardless of the content of the question, (Bynner et al. 1979, p.114), may also contribute to constant error.

### **Reliability of Ajzen and Fishbein scales**

Fishbein and Ajzen (1975) contend that expectancy-value measures, where the subject assigns an evaluation, are consistent with standard attitude scale measures in which the investigator has assigned a value for the evaluation of each statement. They claim that standard attitude scales are generally highly reliable, giving high test - retest correlations. They cite a number of specific reliability studies and conclude that 'the question of reliability does not pose a major problem for measurement of beliefs, attitudes and intentions when appropriate instruments are employed'.

In the present study, the reliability was measured by the test - retest method, that is, the questionnaires were presented to the same group of respondents on two separate occasions, ensuring that the test situations were as similar as possible on each occasion, e.g. the use of the same room and test administrator, on the same day of the

week, at the same time of day. These similarities were intended to reduce the variable or random error (Ev) of the scores. The reliability was then estimated by the correlation between the two sets of scores. One disadvantage of this method is that the first testing may have had an effect on the second one, for example, some respondents may have remembered their answers to the first questionnaire and others may not. However, it is probably the most practical way of investigating the reliability of the somewhat heterogeneous instruments used for the present study: split-half methods (Nuttall 1979) are suitable only for homogeneous (unidimensional) tests.

#### **The empirical test - retest reliability study**

Representative samples of pupils completed questionnaires on two occasions, seven to ten days apart. Correlations between their individual responses on each occasion were computed.

It was planned to include a sample of approximately 90 pupils in the study, consisting of:

- 30 lower school pupils (aged 11 - 13 years)
- 30 middle school pupils (aged 13 - 15 years)
- 30 upper school pupils (aged 15 - 18 years)

Each pupil completed a pair of questionnaires, thus approximately 180 questionnaires were completed on each occasion, 45 (180/4) of each type: Alcohol; Smoking; Keeping Fit and Diet.

The procedures used in the reliability testing followed as far as possible those used in the main survey:

- a) The questionnaires were stapled together in pairs, as in the main survey: to each pair was attached a cover

page containing the title and instructions. The twelve possible combinations of pairs were used as in the main survey (see pages 5.30).

- b) Each pupil completed a pair of questionnaires on the first occasion. Seven to ten days later, the same pupils completed further copies of the same pair of questionnaires. Before completing them the following statement was read out:

'In any test of opinions there are no right or wrong answers - only what you yourself think. In order to find out whether you have genuinely put down what you think, it would be most helpful if you would fill in the questionnaires again. Do not try to remember how you answered last time: think about each question afresh and put down what you think.'

- c) Anonymity was maintained as far as possible. As the nature of the questionnaires was personal, honesty of response was likely to correspond with perceived anonymity, so each pupil was allotted a code number by the class teacher, the questionnaires were similarly coded on the back. The class teacher distributed the coded questionnaires to the appropriate pupils. This procedure was repeated 7 - 10 days later, ensuring that pupils received questionnaires concerning the same topics on the second occasion. The author received matched coded pairs of completed questionnaires, the class teacher keeping the coded lists of pupils' names, thus anonymity was maintained.

In the event eighty-three pupils each completed a pair of questionnaires on the first occasion, but only 70 of these



pupils completed further copies of the same pair of questionnaires on the second occasion. The sample was depleted because: a number of 5th year pupils 'left school' without official permission one week before they were legally entitled to do so; some of the 3rd year pupils were absent on the second occasion because they had been taken on a history trip. It was not possible to administer the test to the those pupils during the next two weeks because they were occupied with examination revision and examinations; some pupils were absent from school due to other reasons, e.g. illness.

At least 30 copies of each questionnaire (Alcohol, Smoking, Keeping Fit, Diet) had been completed on two occasions. This was considered to be sufficient, so no further cases were tested.

Questionnaires from the reliability study were scored, as in the main survey (see page 7.6). The following variables were then computed for each reliability test following the same procedures as those used in the main survey (see pages 8.2 to 8.5).

Code	Computed Variable
AI	Alcohol Intentions
Sum AB	Alcohol Beliefs
ASP	Alcohol Social Pressures
SI	Smoking Intentions
Sum SB	Smoking Beliefs
SSP	Smoking Social Pressures
KI	Keeping Fit Intentions
Sum KB	Keeping Fit Beliefs
KSP	Keeping Fit Social Pressures
DPI	Diet: Protein Intentions
Sum DPB	Diet: Protein Beliefs
DPSP	Diet: Protein Social Pressures

DFI	Diet: <b>F</b> ibre Intentions
Sum DFB	Diet: <b>F</b> ibre Beliefs
DFSP	Diet: <b>F</b> ibre Social Pressures
DSI	Diet: <b>S</b> alt Intentions
Sum DSB	Diet: <b>S</b> alt Beliefs
DSSP	Diet: <b>S</b> alt Social Pressures
DGI	Diet: <b>G</b> reens,fruit,salad Intentions
Sum DGB	Diet: <b>G</b> reens,fruit,salad Beliefs
DGSP	Diet: <b>G</b> reens,fruit,salad Social Pressures
DWI	Diet: <b>s</b> weets/sugar Intentions
Sum DWB	Diet: <b>s</b> weets/sugar Beliefs
DWSP	Diet: <b>s</b> weets/sugar Social Pressures
DAI	Diet: <b>f</b> At Intentions
Sum DAB	Diet: <b>f</b> At Beliefs
DASP	Diet: <b>f</b> At Social Pressures

SPSS 'Frequencies General' and 'Statistics All' were specified for the computed variables of each reliability study. The range of frequencies, means and standard deviations of these computed variables were compared with those of the computed variables from the main survey. They were found to correspond quite closely (see Appendix 07), indicating that the pupils in the reliability study were from the same population as those in the main survey.

SPSS 'Pearson Correlation' was then specified for each computed variable from the first reliability test with the corresponding computed variable from the re-test.

**Table 21: Correlation of Computed Variables from the first occasion with those from the second occasion (n=30 app.)**

Computed Variable	$r_{tt}$
AI	0.92
Sum AB	0.77
ASF	0.63
SI	0.96
Sum SB	0.88
SSP	0.96
KI	0.94
Sum KB	0.85
KSP	0.73
DPI	0.57
Sum DPB	0.56
DPSP	0.55
DFI	0.85
Sum DFB	0.88
DFSP	0.69
DSI	0.85
Sum DSB	0.81
DSSP	0.61
DGI	0.85
Sum DGB	0.89
DGSP	0.66
DWI	0.86
Sum DWB	0.57
DWSP	0.66
DAI	0.83
Sum DAB	0.65
DASP	0.63
$p < 0.01$ in all cases	

The assumption in regression analysis is that the dependent variable (Intentions in this study) is totally reliable. These correlations indicate that, with the exception of Diet: Protein, the Intention scores are acceptably reliable. This tendency for the Intention scores to be reliable was further supported by what pupils had to say in interviews, in the external validity study, concerning the relationship between their Intentions and Behaviour, see Appendix 10.

On the whole, the reliabilities of the Belief and Social Pressures measures were lower than those of the corresponding Intentions. This could be because the Intention scales are relatively circumscribed, for example, pupils will know if they intend to smoke cigarettes. On the other hand, Beliefs and perceptions of Social pressure about aspects of health behaviour are less clear-cut and pupils are consequently less likely to be firm about them.

### **Validity of the scales**

Attempts to assess the validity of a measuring instrument can take several forms.

#### ***Face validity and content validity***

The items in the questionnaires were deliberately expressed in an overt form, using the pupils' own words as far as possible. Common sense confirms that they are about intentions to behave in particular ways with respect to the four topics, evaluated beliefs concerning the topics and motivations to comply with the wishes of significant referents. Face validity was thus ensured.

The elicitation of intentions, salient beliefs and significant referents, in the ways described by Ajzen and Fishbein, that is, by exhaustively sampling the domain and empirically selecting items (see Chapter 4), ensured the content validity of these scales.

***Convergent and discriminant validity***

If a new instrument is a valid measure of a particular construct then it should correlate highly with other established measures of the same construct, that is, it should show *convergent* validity (Nuttall 1979, p.57). Both Fishbein and Ajzen (1975, pp.109-112) and Nuttall argue that an instrument should also show *discriminant* validity, that is, measurements on the instrument should *not* correlate with theoretically unrelated constructs.

***Multitrait-multimethod matrix***

Campbell and Fiske (1959) further refine convergent and discriminant validity measurements, suggesting a procedure known as the multitrait-multimethod matrix. This involves the measurement of at least two traits (or attitudes) by at least two methods. The matrix consists of inter-correlations of the different traits assessed by the same methods, as well as of the same traits measured by the same methods (i.e. reliabilities).

The convergent validity of the 'Alcohol' questionnaire could have been investigated by the correlation of scores from it with scores from the questionnaire concerning Adolescent Alcohol Use prepared by Schlegel, Crawford and Sanborn (1977). They reported on its use with boys only, however. Furthermore it is questionable whether this instrument could be regarded as 'an established measure'. The author was unable to discover any other questionnaires, designed for use with adolescents, based on the Ajzen and Fishbein model. Thus, it was not possible to test convergent validity or discriminant validity of the the scores from the

Alcohol, Smoking, Keeping Fit or Diet questionnaires by comparing them with scores from questionnaires of a similar format.

It would have been possible, however, to compare scores from the attitude (evaluated belief) components of the new instruments with scores from attitude scales of a different type, measuring the same trait or different traits. For example, the attitude of boys towards smoking, as measured by this present instrument, could have been compared with their attitude towards smoking, as measured by Bynner's (1969) Likert scale. Thus a measure of *convergent* validity could have been obtained, but again for boys only, and for one component only of the Smoking questionnaire. *Discriminant* validity could similarly have been investigated by comparing attitude scores derived from these present instruments with scores from say, Attitudes to Learning a Foreign Language (Roger, D., Bull, P. and Fletcher, R. 1981).

In the absence of suitable convergent measures, discriminant validity measures are not very helpful, because they can only indicate what the new instrument is *not* measuring, for example attitudes to learning a foreign language. In no way will they indicate that the new instrument *is* measuring what it purports to measure. Because of the lack of suitable established instruments with which to compare all the various components of the questionnaires, convergent and discriminant validity were not investigated prior to the main survey.

A type of convergent and discriminant validity was evident, however, post hoc in the results of the main survey. A matrix of scale inter-correlations was prepared (Table 59). Inspection of this shows that correlations within each topic are generally higher than correlations between the different topics (Diet being considered as a single topic).

### ***Criterion-related validity***

Criterion-related validity is assessed by calculating the correlation between the scores on a test and scores on some criterion measure (Nuttall 1979). Within each topic, the *criterion-related* validity of the evaluated belief scales, and the motivations to comply with significant referents scales were assessed by calculating their correlations with the scores on the criterion measure of *intentions*. This was also a measure of the *internal validity* of the model as used in this study (see Chapter 9 and pages 10.1 to 10.4).

The criterion-related validity of the intention scales was assessed by investigating the correlations between intentions and behaviour. This is also a measure of the *external validity* of the Ajzen and Fishbein model. (see pages 3.6 and 3.7).

For this purpose, the question arises as to how best to monitor health behaviour. This could be achieved by the use of self report diaries. Other methods might be attempted, for example, direct observation of subjects' health behaviour by the author. Alternatively, subjects' friends or close relatives could be asked to observe their behaviour and to keep an accurate daily diary of it. Apart from

practical considerations, there are obvious problems with both of these approaches. Subjects may not behave normally when they know they are being observed, their behaviour may become more positive or more negative with respect to certain activities. On the other hand, it may be considered unethical to observe individuals over such matters for long periods of time without their prior knowledge and willing consent.

For these reasons, in this present study, it was decided to use self-report diaries for monitoring behaviour. The relationship between intentions and behaviour were investigated by asking subjects, who had previously completed an Intention questionnaire, to keep a Behaviour diary, then correlating the scores from each source.

**The empirical investigation of the external validity of the Ajzen and Fishbein model as applied in this present study**

***Preparation of instruments***

A 'Survey of Health Behaviour Intentions' was prepared. The cover page explained the substance of the survey, made provision for identifying coding (pupils' name or code, school, age, sex) and a practice question. The survey itself consisted of a compilation of the 'Intention' scales from the questionnaires on drinking alcohol, smoking, keeping fit and diet (see Appendix 08).

Self-report diaries of health behaviour were prepared for the four topics. For ease of recognition they were printed on coloured paper in accordance with the main survey (see Appendix 09). The approach will be exemplified by that for drinking alcohol.



*Diary of Health Behaviour: drinking Alcohol*

Pupils were asked to indicate on a calendar for four weeks, times when they drank alcohol in the situations specified on the 'Intention' Scales:

At home with the family;

At the homes of friends or relatives;

With friends in pubs or clubs.

They were asked to keep the diary for four weeks because this was the time specified on the 'Intention' scales. (The month and date spaces were filled in by the pupils, thus allowing for flexibility of timing). Pupils were asked to put a cross when they did not drink alcohol, on a particular day in a particular situation, as a check on the completeness of the record. They were not asked to indicate the amount or type of alcohol they drank, since this was not investigated in the 'Intention' scales.

*Diaries of Health Behaviour: Smoking cigarettes, Keeping fit and Diet*

The format of these Diaries is similar to the 'Drinking Alcohol' Diary, except in the following respects:

i) the Keeping Fit diary spans one week;

ii) the Diet diary spans four days;

both in accordance with the 'Intention' scales.

***The survey of Health Intentions and Behaviour***

It is generally recognised that 30 cases is the minimum number acceptable in such studies: it was therefore decided to aim for a sample of 36 cases. If some pupils did not complete the diaries for the whole period, for any reason (e.g. prolonged absence), then at least a minimal sample

would be ensured. It was decided to recruit:

- 12 volunteers from the Lower School (11 - 13 years);
- 12 volunteers from the Middle School (13 - 15 years);
- 12 volunteers from the Upper School (15 - 18 years).

The study was carried out in a school known to the author. One form tutor from each of the 1st, 2nd, 3rd, 4th and 6th years offered their assistance. Because this part of the study was conducted in June, 5th year pupils were not available so the 6th form tutor recruited 12 volunteers, whilst the other four tutors recruited 6 volunteers each (i.e. a total of 36 pupils in 5 groups.) There was selection amongst the volunteers, by the tutors, to ensure that a broad spectrum of social class and academic ability was represented.

For each group separately, the author first administered the 'Survey of Health Behaviour Intentions' and then introduced the four diaries and explained their use.

#### *The completion of the Intention questionnaires*

The title page was read aloud to the group, giving time for the completion of personal details. To maximise the likelihood of honest responses and thus reduce the incorporation of constant error, there was provision for pupils to remain anonymous by using a code name or number if they wished. Pupils then completed the 'Intention' scales under supervision.

*The completion of the diaries*

The four diaries, stapled together in the order: drinking Alcohol; Smoking cigarettes; Keeping Fit; Diet were then given out and pupils were asked to put their name or code on each one, ensuring that if they had used a code they copied it exactly from the cover page of the Intention questionnaires, which was then collected. The use of the diaries was explained and pupils were asked to fill in the month and date spaces.

The twelve upper school volunteers (reliable 6th form students known to the author) agreed to keep their diaries themselves, fill them in each day and return them at the end of the four weeks.

The author retained the remaining diaries and presented them to each group on the day after they had completed their 'Intention Survey': they then completed the first day of the Diary with guidance from the author. The four form tutors responsible for the younger pupils, agreed to keep the diaries, distribute them each morning during tutorial time and supervise their completion. The author visited the groups as often as possible to check that all was well. Thus every effort was made to reduce random error, since pupils completed the diaries daily, avoiding the need to remember their behaviour over a longer period.

One or two problems arose with the younger pupils during the first week of this study. A number of them had not completed their Diet Diary (4 days) by Friday morning: it was thought that they would not remember what they had eaten on Friday,

Saturday and Sunday by the following Monday morning (although they would most likely remember when they drank alcohol, smoked cigarettes or engaged in physical exercise). Pupils were therefore asked to take their diaries home over this first week end and complete them daily. The author arranged to see them on the following Monday morning to check that the arrangement had been satisfactory. In the event, all pupils returned their completed diaries, as requested, on the following Monday morning. Another problem arose at the end of the first week: two third year girls announced that they would not be in school the following week, because they were going on holiday. However, they offered to take their diaries with them and agreed to complete them daily.

At the end of the four weeks, all the diaries were collected.

### ***Scoring the Intention questionnaires***

The Alcohol questionnaire will again be used as an example of the scoring procedure. Each Intention item was scored 0-3, as in the main survey: the total Intention score thus ranged from 0 to 9, as follows:

**INTENTIONS: DRINKING ALCOHOL**

During the next month, I think I will drink alcoholic drinks:

- 1) at home with my family,  
definitely no - perhaps - quite likely - definitely yes  
10 1 2 3 score range 0 to 3)
- 2) at the homes of friends or relatives,  
definitely no - perhaps - quite likely - definitely yes  
10 1 2 3 score range 0 to 3)
- 3) with my friends in pubs or clubs.  
definitely no - perhaps - quite likely - definitely yes  
10 1 2 3 score range 0 to 3)

The total score range was thus 0 to 9.

The questionnaires measuring Intentions to smoke, take part in physical exercise and eat certain kinds of food were scored in a similar way, to summarise:

Code	Topic Intentions	Questionnaire Items	Total Score Range
AI	Alcohol	1+2+3	0 to 9
SI	Smoking	1+2+3	0 to 9
KI	Keeping fit	1+2+3	0 to 9
DPI	Diet, protein	1	0 to 3
DFI	Diet, fibre	2	0 to 3
DSI	Diet, salt	3	0 to 3
DGI	Diet, greens	4+6+8	0 to 9
DWI	Diet, sweets	5+11	0 to 6
DAI	Diet, fats	7+9+10	0 to 9

**Scoring the diaries**

The Behaviour diaries are exemplified by that for drinking Alcohol.

## DIARY OF HEALTH BEHAVIOUR: DRINKING ALCOHOL

Your name or code: \_\_\_\_\_

Please put a tick in the appropriate date column when you drank alcohol in the following places: put a cross if you did not.

	WEEK1							WEEK2						
Month														
Date														
1. At home with the family.														
2. At the homes of friends or relatives.														
3. With friends in pubs or clubs.														

	WEEK3							WEEK4						
Month														
Date														
1. At home with the family.														
2. At the homes of friends or relatives.														
3. With friends in pubs or clubs.														

Each day that pupils recorded drinking Alcohol in any of the three situations specified, they were credited with one point. The range of total Behaviour scores was thus 0 to 84. The scores for Behaviour variables for Smoking, Keeping Fit and Diet were calculated in an exactly similar way to that

of the Alcohol Behaviour diary, in summary:

Code	Topic Behaviours	Questionnaire Items	Total Score Range
AB	Alcohol	1+2+3	0 to 84
SB	Smoking	1+2+3	0 to 84
KB	Keeping fit	1+2+3	0 to 21
DPB	Diet, protein	1	0 to 4
DFB	Diet, fibre	2	0 to 4
DSB	Diet, salt	3	0 to 4
DGB	Diet, greens	4+6+8	0 to 12
DWB	Diet, sweets	5+11	0 to 8
DAB	Diet, fats	7+9+10	0 to 12

### Relationships between pupils' Intentions and self-reported Behaviour.

Product-moment correlations were computed between the scores from the Intention questionnaires and from the diaries. This was followed by interviews with selected pupils to further investigate the relationships between Intentions and Behaviour with respect to these aspects of health behaviour. The product-moment correlations between behavioural intentions and self-reported behaviour were as follows:

**Table 22: Correlation of Intentions with Behaviour**

Relationship				r	n=36
AI	with	AB		0.65	
SI	with	SB		0.87	
KI	with	KB		0.59	
DPI	with	DPB	no variance in DPI (all scores = 3)		
DFI	with	DFB		0.76	
DSI	with	DSB		0.86	
DGI	with	DGB		0.62	
DWI	with	DWB		0.68	
DAI	with	DAB		0.79	

### Pupil Interviews

Pupils were interviewed in order to further investigate the relationships between Intentions and Behaviour with respect to these aspects of health behaviour. Several influencing factors emerged:

- (i) wide differences in the frequency and quantity of particular behaviours considered by pupils to be "a little", or "a lot";
- (ii) random occurrences in the lives of the pupils during the diary period cutting across their intentions;
- (iii) a fleeting sense of "permanence" amongst adolescents concerning what is habitual for them;
- (iv) what is provided by parents, relatives and friends;
- (v) misunderstandings and errors in completing the instruments.

These explanations are discussed and illustrated with examples in Appendix 10.

In the light of these influencing factors, the correlations reported above between Intentions and Behaviour seem very satisfactory, indicating that these Intention scales possess a good measure of criterion-related validity.

Further evidence (see pages 10.11 to 10.17) of the criterion validity of the Intention scales was provided by data from the Balding Health Behaviour Questionnaire, in respect of Alcohol (Balding 1985a) and subsequently for Keeping Fit and Diet (Balding 1985b and 1985c).



## PLANNING AND ADMINISTRATION OF THE MAIN SURVEY

### Survey sample size

The number of pupils included in the main survey was determined by:

1. the number of aspects of health behaviour included in the study and the way in which the questionnaires were collated;
2. the hypotheses to be tested.
3. the method of analysis to be used;

#### 1. *Aspects and collation*

Four aspects of health behaviour: drinking Alcohol; Smoking cigarettes; Keeping Fit and Diet were included in this study. The questionnaires were collated systematically in pairs, as described in pages 5.10 and 5.11.

#### 2. *Hypotheses*

The hypotheses (see page 1.17) to be tested were:

1. that a statistically significant amount of the variance in intentions of adolescents, concerning aspects of health behaviour, is explained by a weighted combination of the variance in their beliefs and the social pressures they experience concerning such behaviour;
2. that overall, both beliefs and social pressures will have a statistically significant influence on intentions;
3. that for girls and boys taken separately, both beliefs and social pressures will have a statistically significant influence on intentions;
4. that for the different age groups taken separately, both beliefs and social pressures will have a statistically significant influence on intentions;
5. that there are no statistically significant differences between the mean beliefs, social pressures and intentions which are attributable to age or gender.

### 3. *Method of analysis used*

Multiple regression was the main method of analysis to be used for testing hypotheses 1 to 4 above. The statistical significance of a correlation is a function of the number of cases included, the larger the number of cases, the lower the correlation necessary for statistical significance. This suggests that the overall sample to be tested should be as large as possible. On the other hand, practical limits of resources impose severe constraints and it was finally decided to aim for a sample of about sixty pupils in each sampling category, by age and by sex (see below).

These considerations determined that approximately 720 pupils would be included in the survey. Each pupil would answer a particular collated pair of questionnaires out of the four (Alcohol, Smoking, Keeping Fit, Diet). Thus approximately 1440 (720x2) individual questionnaires would be completed, 360 on each aspect. Analysis of each aspect, by each of three age groups and by sex would involve sub-dividing the 360 cases into six categories:

- Girls - Lower School (1st. and 2nd. Years)
- Boys - Lower School (1st. and 2nd. Years)
- Girls - Middle School (3rd. and 4th. Years)
- Boys - Middle School (3rd. and 4th. Years)
- Girls - Upper School (5th., 6th. and 7th. Years)
- Boys - Upper School (5th., 6th. and 7th. Years)

Each category would thus contain 60 cases (60 x 6 = 360).

500 copies of each questionnaire were printed, the 140 (500 minus 360) in excess being required for distribution margins, for reliability and validity studies and to allow for wastage due to spoilt papers.

### The sample

The survey was carried out in eight Berkshire Secondary Schools:

- Five Mixed Comprehensive Schools;
- One Boys' Comprehensive School;
- One Girls' Comprehensive School;
- One Secondary Modern School.

They were selected so that in aggregate they represented proportionately the whole spectrum of social class background for the region. Thus, as described by their teachers:

- two schools had a predominantly middle class intake;

- two schools had a mixed social class intake;

- three schools (in city areas) had a substantial immigrant intake;

- one school from a 'new town' had a mixed social class intake.

The aim was to collect data from approximately 90 pupils in each school as follows:

- 30 pupils from the Lower School
- 30 pupils from the Middle School
- 30 pupils from the Upper School

Thus, 90 pupils x 8 schools would provide 720 cases, as planned.

As far as possible the testing was carried out when pupils were in 'mixed ability groups' such as their Tutor Groups or classes such as Social Education, Careers, Lower School Religious Education etc.. Since for convenience intact groups were tested and class size varied greatly, some schools provided slightly more than 90 pupils and others slightly less but approximate numbers were deemed to be adequate. In the event, a total of 740 pupils completed the questionnaires.

### Administration

The author administered as many of the questionnaires as possible. Pupils were asked to sit apart and not to talk to each other. The questionnaires were distributed from packs of 12, each containing the combinations described on pages 5.10 and 5.11, in order to ensure equal distribution of each type of questionnaire. The title page was read out aloud, allowing time for pupils' responses to the practice examples and for questions. Pupils were then asked to examine their two questionnaires, their attention being drawn to the statement at the end of each one, asking them to make sure that they had put a circle round a given number of words in each questionnaire, as a check on completeness of response. When the first pupils appeared to be finishing, the following instructions were displayed, using an overhead projector when available.

- \* *At the end of each questionnaire you are told how many circles you should have: count your circles and make sure that you have not missed any questions.*

*Then, on the back of your questionnaire either:*

1. *Make a list of 'Health' topics which you would like to learn about in school. Give your reasons.*

*OR*

2. *Design a 'Good Health Behaviour' poster.*

These later two activities were intended to ensure that pupils who had finished first were occupied while other pupils were completing their questionnaires, some combinations of which contained a larger number of items than others (see Appendix 05).

On several occasions the class teachers administered the questionnaires. The following written instructions were given to them.

**To start**

*Pupils should sit apart and not talk. Please read through the title page aloud with pupils. Allow time for responses, explain the practice questions and answer any queries.*

**To finish**

*Some pupils will finish quickly, others will take more time. Please display the enclosed transparency or write up the instructions from it on the board. (See instructions above \*)*

Thus in principle, the administrative conditions for all pupils were as similar as possible although it must be noted that some of the settings were less formal than would have been desired ideally. Also, pupils in classes of 'mixed ability' took part in this main survey and a proportion of them may have found difficulty in reading and understanding the questionnaires. If such poor readers had been omitted, the sample would have been biased, but it is accepted that some of them may have merely circled words at random thus increasing the amount of 'variable or random error' (see pages 6.1 and 6.2) included in the data.

When all the questionnaires were completed (but not necessarily the extra work), they were collected. The title pages were coded and a record was kept of how many questionnaires from each age group and sex were collected from each school.

**Scoring**

Scoring of the questionnaires had previously been piloted (see Appendix 04). As a result of this piloting the following scoring was used:

Intentions	0 to 3
Strength of Beliefs	-2 to +2
Evaluation of Beliefs	0 to 3
(Negative evaluations were converted to 0 to -3 at a later stage)	
Social Pressure	0 to 3
Motivation to comply	0 to 3

Provision was made at the beginning of each questionnaire to code for the particular scale. They were coded as follows:

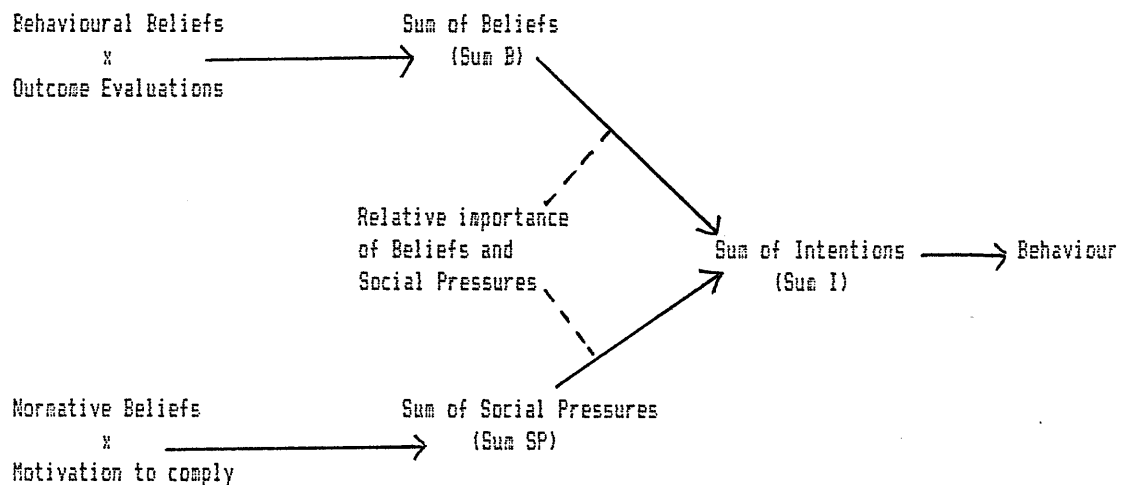
Alcohol	1
Smoking	2
Keeping fit	3
Diet	4

Transparencies for scoring were prepared: a score of '9' was used for missing data. A group of reliable 6th Form 'A' Level students were employed to help to score the questionnaires. A few questionnaires were not used because they had been incorrectly completed. This included 3 intact pairs and 11 singles from pairs (a few pupils had omitted pages). Spot checks on representative samples of helpers' scoring were made: their scoring was found to be extremely accurate.

## THE ANALYSIS OF THE DATA

### Computing the variables

The relationships amongst Beliefs, Social Pressures, Intentions and Behaviour may be represented by the Ajzen and Fishbein Model, modified as discussed in Chapter 3, and summarised on page 3.9, as follows:



The questionnaires in the present survey measured:

1. Intentions (I).
2. Beliefs and Outcome Evaluations from which sum of Beliefs (Sum B) was calculated.
3. Normative Beliefs and Motivations to comply, from which sum of Social Pressures (Sum SP) was calculated.

It was intended to use multiple regression analysis to investigate the relationship between Intentions and their determinants, Beliefs (Sum B) and Social Pressures (Sum SP), for each of the topics, thus:

$$\begin{array}{c}
 \text{Sum B} \\
 \swarrow \\
 \quad \quad w_1 \\
 \quad \quad \text{--- Sum I} \\
 \quad \quad \swarrow \\
 \quad \quad w_2 \\
 \text{Sum SP}
 \end{array}$$

where  $w_1$  and  $w_2$  are the relative weightings.

Thus for each scale the following composite variables Sum I, Sum B and Sum SP were computed, where:

Sum I = Sum of intention items on a particular scale;

Sum B = Sum of (Behavioural Beliefs x  
their Outcome Evaluations);

Sum SP= (Sum of Normative Beliefs [w.r.t parents] x  
Motivation to comply) +  
(Sum of Normative Beliefs [w.r.t. friends] x  
Motivation to comply).

These values were computed for each scale in the following way. Firstly each item on each questionnaire was allocated a variable 'code', e.g. **A** for Alcohol (see questionnaires, Appendix 05)

### ***The Alcohol Scale***

The Alcohol scale will again be used as an example of the procedure for computing the variables.

#### ***(i) Intentions***

Items 1 to 3 (Intentions) were allocated AI1, AI2, AI3 (Alcohol Intentions 1 to 3).

Intentions to drink Alcohol (Sum **AI**) =  
Sum of individual Intention items to drink Alcohol =  
AI1 + AI2 + AI3.

#### ***(ii) Beliefs***

Items 4 to 17 were Beliefs and their Evaluation.  
Item 4 was therefore allocated two codes ASB1 and AEB1  
(Alcohol Strength of Beliefs 1,  
Alcohol Evaluation of Beliefs 1)  
and so on as far as item 17 (allocated ASB14 and AEB14).

Sum of Beliefs about drinking Alcohol (Sum **AB**) =  
Sum of the products of each strength of belief item  
concerning drinking Alcohol and its respective evaluation,  
i.e. (ASB1 x AEB1) + (ASB2 x AEB2) + ...  
and so on to (ASB14 x AEB14).



**(iii) Social Pressures**

Items 18 to 20 were perceptions of Social Pressures, ASP1 to ASP3 (Alcohol Social Pressures 1 to 3). Item 21 was the strength of Motivation to comply (evaluation) with these three 'Social Pressures', ASPE1 (Alcohol Social Pressure Evaluation). Similarly Items 22 to 24 were allocated ASP4 to ASP6 and item 25, ASPE2.

Sum of Social Pressures to drink Alcohol (Sum ASP) =  
 (Sum of Social Pressures from parents concerning drinking Alcohol x Motivation to comply with parents) +  
 (Sum of Social Pressures from friends concerning drinking Alcohol x Motivation to comply with friends). =  
 [(ASP1 + ASP2 + ASP3) x ASPE1] +  
 [(ASP4 + ASP4 + ASP6) x ASPE2].

These computed variables were used in the multiple regression analyses.

**The Smoking and Keeping Fit scales**

For Smoking and Keeping Fit, items in the respective questionnaires were given codes S and K and in a similar way, Sum SI, Sum SB, Sum SSP and Sum KI, Sum KB, and Sum KSP were computed and these composite variables used in the multiple regression analyses.

**The Diet scale**

As explained in Chapter 6, since it referred to different kinds of food, the Diet scale had to be treated slightly differently from the others. Thus the following 'composite variables' and 'variables' were computed.

**(i) Intentions**

The intention to eat protein is coded  
 DPI (Diet Protein Intention)  
 DPI = DI1: single item scale

The intention to eat fibre is coded  
 DFI (Diet Fibre Intention)  
 DFI = DI2: single item scale

The Intention to eat additional salt is coded  
 DSI (**D**iet **S**alt **I**ntention)  
 $DSI = DI3$ : single item scale

The Intention to eat greens, salads and fruit is coded  
 sum DGI (**D**iet **G**reen **I**ntentions)  
 $Sum\ DGI = DI4 + DI6 + DI8$

The intention to eat sweets, sweet food and sugar is coded  
 sum DWI (**D**iet **S**weets **I**ntentions)  
 $Sum\ DWI = DI5 + DI11$   
 (The second letter of **s**weets (**w**) was used, since 'S' was used to represent additional salt.)

The intentions to eat Fats is coded  
 sum DAI (**D**iet **F**ats **I**ntentions)  
 $sum\ DAI = DI7 + DI9 + DI10$   
 (As with sweets, the second letter of **f**ats was used because 'F' had already been used to represent fibre.)

### **(ii) Beliefs**

Sum of Beliefs about eating proteins is coded  
 Sum DPB (Sum **D**iet **P**rotein **B**eliefs)  
 $Sum\ DPB = (DSB8 \times DEB1) + (DSB18 \times DEB5) + (DSB19 \times DEB6)$

Sum of Beliefs about eating fibre is coded  
 Sum DFB (Sum **D**iet **F**ibre **B**eliefs)  
 $Sum\ DFB = (DSB4 \times DEB1) + (DSB20 + DEB7) + (DSB21 \times DEB8)$

Sum of Beliefs about eating additional salt is coded  
 Sum DSB (Sum **D**iet **S**alt **B**eliefs).  
 $Sum\ DSB = (DSB6 \times DEB1) + (DSB24 + DEB11)$

Sum of Beliefs about eating greens, salads and fruit is coded  
 Sum DGB (Sum **D**iet **G**reens **B**eliefs)  
 $Sum\ DGB = [(DSB1 + DSB3 + DSB7) \times DEB1] + [(DSB11 + DSB12) \times DEB2] + [(DSB15 + DSB17) \times DEB4]$

Sum of Beliefs about eating sweets and sugar is coded  
 Sum DWB (Sum **D**iet **S**weets **B**eliefs)  
 $Sum\ DWB = (DSB5 \times DEB1) + (DSB13 \times DEB3) + (DSB22 \times DEB9)$

Sum of Beliefs about eating fats is coded  
 Sum DAB (Sum **D**iet **F**ats **B**eliefs)  
 $Sum\ DAB = [(DSB2 + DSB9 + DSB10) \times DEB1] + (DSB14 \times DEB3) + (DSB16 \times DEB4) + (DSB23 \times DEB10)$

### **(iii) Social Pressures**

Social Pressures concerning eating protein is coded  
 DPSP (**D**iet **P**rotein **S**ocial **P**ressures)  
 $DPSP = (DSP1 \times DSPE1)$

Social Pressures concerning eating fibre is coded  
 DFSP (**D**iet **F**ibre **S**ocial **P**ressures)  
 $DFSP = (DSP2 \times DSPE1)$

Social Pressures concerning eating additional salt is coded  
 DSSP (Diet Salt Social Pressures)  
 $DSSP = (DSP3 \times DSPE1)$

Social Pressures concerning eating greens, salads and fruit is coded  
 Sum DGSP (Sum Diet, Greens, Social Pressures)  
 $Sum\ DGSP = (DSP4 + DSP6 + DSP8) \times DSPE1$

Social Pressures concerning eating sweets and sugar is coded  
 Sum DWSP (Sum Diet Sweets Social Pressures)  
 $Sum\ DWSP = (DSP5 + DSP11) \times DSPE1$

Social Pressures concerning eating fats is coded  
 Sum DASP (Sum Diet Fats Social Pressures)  
 $Sum\ DASP = (DSP7 + DSP9 + DSP10) \times DSPE1.$

These computed 'Diet' variables were used in the multiple regression analyses.

### **A First Analysis of the Data**

An SPSS program, 'Frequencies - General': 'Statistics - All' was specified for all the variables, raw and computed. The range of frequencies for each raw variable was checked and found to be within the expected limits, confirming that the data had been entered correctly. The output for each computed variable was then checked. Errors were detected and rectified and the analysis repeated until the results confirmed that the computed variables were specified correctly.

### **Regression Analysis**

Multiple regression analysis was used to test Hypothesis 1, concerning the statistical significance of the amount of the variance in Intentions (the dependant variable) which is explained by a weighted combination of the variances in Beliefs and Social Pressures (the independent variables). It was then used to test Hypothesis 2, which is concerned with the relative importance (i.e. weightings  $w_1$  and  $w_2$ ) of

the independent variables in determining Intentions, and Hypotheses 3 and 4 concerning the relative importance of the independent variables by age and by gender. Thus, for each analysis, the statistical significance of the difference between the correlation of Beliefs with Intentions and that of Social Pressures with Intentions was evaluated using Fisher's z transformation (Lewis 1969, page 180).

A step-wise regression analysis was specified, the computer entered the two independent variables or 'predictors' in single steps, the best predictor being entered first. Such analyses were specified for the following scales:

Drinking Alcohol;  
Smoking;  
Keeping Fit;

and the sub-scales:

Diet - eating protein;  
Diet - eating fibre;  
Diet - eating salt;  
Diet - eating green vegetables salad and fruit;  
Diet - eating sweet foods;  
Diet - eating fatty foods.

### **Analysis of variance**

Hypothesis 5 is concerned with the differences in the Beliefs, perceived Social Pressures and Intentions attributable to age and gender. To test the statistical significance of differences between the means of the various sub-samples (i.e by age and by gender) an SPSS procedure ONEWAY was used (Norusis 1982 page 75). Scheffe's test was specified when testing the significance between more than two means: the default on this procedure is set at a significance level of 0.05.

**Investigation of inter-scale, including inter-topic, relationships**

It will be recalled that provision was made for investigating the relationships between the topics (see pages 5.10 and 5.11) in order to test the conclusions of the earlier work reported in Appendix 01. For this purpose, SPSS Factor Analysis was specified for all computed variables, i.e. each scale. Type FA2, rotated to an oblique solution was specified, as in the factor analyses reported in Appendix 01.

The results of all analyses are set out in Chapter 9.

## RESULTS OF THE MAIN SURVEY

### Presentation of the results

The results of the analyses of the main survey are presented for each topic in turn. The topics are: Alcohol, Smoking, Keeping Fit, and Diet: Protein; Fibre; Salt; Green vegetables and Fruit; Sweet Foods; Fatty Foods.

For each topic the results are set out in the following sequence:

- (i) the regression of Beliefs and Social Pressures on Intentions, i.e. testing hypotheses 1, 2 and 3 (see page 7.1);
- (ii) the analysis of variance of
  - a) Intentions
  - b) Beliefs
  - c) Social Pressuresi.e. testing hypotheses 4 and 5.

Results are reported, along with their statistical significance, in the following order:

- (i) for all cases;
- (ii) by gender;
- (iii) by year group;
- (iv) by gender and by year group.

Preliminary comments are made at the end of each topic: the detailed discussion of results appears in Chapter 10.

Finally, the investigation of inter-scale and inter-topic relationships are presented as follows:

- (i) matrix of intercorrelations;
- (ii) factor analysis;
- (iii) factor intercorrelations.
- (iv) preliminary comments on inter-scale and inter-topic relationships.

***Numbers of cases and missing data***

In the following tables it will be noticed that the number of cases (sometimes referred to as 'n') differs from one analysis to another within each topic. This is the result of a decision not to substitute average values for incomplete responses, but to treat them as missing data. The whole scale for the pupil in question was thus omitted from the analysis if even one item was incomplete. For the multiple regression analyses, the scales for Intentions, Beliefs and Social Pressures had all to be complete for the data from any pupil to be included.

***Statistical significance***

Wherever the term 'significant' is used in the preliminary comments following the tables, statistical significance is implied.

## Alcohol scale

**Table 23: Regression analysis - Alcohol scale**  
 sum AI(dependent variable) with sum AB and sum ASP

<b>(a) All cases and by gender</b>		All cases	All Girls	All boys
No. of cases		334	168	166
AI with AB $r=$		0.53	0.50	0.55
AI with ASP $r=$		0.47	0.51	0.42
AB with ASP $r=$		0.41	0.39	0.43
Multiple $R=$		0.60	0.61	0.59
Multiple $R^2=$		0.36	0.37	0.35
F		92.05	48.48	43.09
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta AB		0.41	0.35	0.46
F		71.54	27.68	42.51
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta ASP		0.30	0.38	0.22
F		38.61	31.80	10.22
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$

<b>(b) By year group</b>		All Cases		
		Lower	Middle	Upper
No. of cases		102	104	128
AI with AB $r=$		0.52	0.43	0.48
AI with ASP $r=$		0.45	0.20	0.43
AB with ASP $r=$		0.50	0.10	0.42
Multiple $R=$		0.57	0.46	0.55
Multiple $R^2=$		0.32	0.21	0.30
F		23.46	13.44	26.46
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta AB		0.40	0.41	0.36
F		17.54	21.73	19.31
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta ASP		0.25	0.16	0.28
F		6.91	3.27	11.67
Significance of F		ns	ns	ns

<b>(c) By gender and year group</b>		Girls			Boys		
		Lower	Middle	Upper	Lower	Middle	Upper
No. of cases		51	49	68	51	55	60
AI with AB $r=$		0.38	0.38	0.47	0.58	0.47	0.50
AI with ASP $r=$		0.34	0.06	0.54	0.44	0.29	0.31
AB with ASP $r=$		0.27	0.33	0.46	0.58	0.15	0.34
Multiple $R=$		0.45	0.38	0.59	0.59	0.52	0.52
Multiple $R^2=$		0.20	0.14	0.35	0.35	0.27	0.27
F		6.16	3.88	17.57	12.68	9.41	10.49
Significance of F		$p<0.01$	$p<0.05$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$
Beta AB		0.31	0.37	0.28	0.49	0.43	0.44
F		5.47	7.55	6.14	11.47	12.95	13.68
Significance of F		$p<0.05$	$p<0.01$	$p<0.05$	$p<0.01$	$p<0.01$	$p<0.01$
Beta ASP		0.25	0.05	0.41	0.15	0.22	0.16
F		3.62	0.14	13.34	1.08	3.43	1.72
Significance of F		ns	ns	$p<0.01$	ns	ns	ns



**Table 24: Means, Standard Deviations, Analysis of Variance:  
Alcohol Intentions**

(sum AI range 0 to +9)

**(a) All cases**

	All cases	
	n=360	
<hr/>		
M	3.69	
SD	2.43	
<hr/>		

**(b) By gender**

	Girls	Boys	
	n=174	n=186	
<hr/>			
M	3.45	3.91	
SD	2.37	2.46	
<hr/>			

F=3.18 df 1,358 p<0.08

**(c) By year groups**

		All cases			
		<hr/>			
	Lower	Middle	Upper		
	n=115	n=113	n=132		
<hr/>					
M	2.35	3.71	4.80		
SD	1.88	2.24	2.50		
<hr/>					

F = 32.86 df 2,357 p<0.01

**(d) By gender and by year groups**

		Girls					Boys			
		<hr/>					<hr/>			
	Lower	Middle	Upper		Lower	Middle	Upper			
	n=54	n=50	n=70		n=61	n=63	n=62			
<hr/>										
M	1.85	3.86	4.40		2.93	3.67	5.11			
SD	1.81	1.96	2.42		1.82	2.45	2.55			
<hr/>										

F=23.40 df 2,171 p<0.01

F=14.35 df 2,183 p<0.01

**(e) Year groups taken separately, by gender**

Lower school: F=10.24 df 1,113 p<0.01

Middle school: F= 0.21 df 1,111 p<0.65

Upper school: F= 2.71 df 1,130 p<0.10

**Table 25: Means, Standard Deviations, Analysis of Variance:  
Alcohol Beliefs**

(sum AB range -84 to +84)

**(a) All cases**

	All cases	
	n=340	
<hr/>		
	M   -15.78	
	SD   16.57	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=171		n=169	
<hr/>					
	M	-18.90		-12.63	
	SD	16.62		15.96	
<hr/>					

F=12.57 df 1,338 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=104	n=106	n=130	
<hr/>					
	M	-22.29	-15.40	-10.88	
	SD	16.84	15.69	15.38	
<hr/>					

F=14.84 df 2,337 p<0.01

**(d) By gender and by year groups**

		Girls					Boys			
		<hr/>					<hr/>			
		Lower	Middle	Upper			Lower	Middle	Upper	
		n=52	n=50	n=69			n=52	n=56	n=61	
<hr/>										
	M	-26.40	-15.84	-15.45			-18.17	-15.00	-5.72	
	SD	15.92	14.87	16.71			16.88	16.51	11.88	
<hr/>										

F=8.29 df 2,168 p<0.01

F=10.54 df 2,166 p<0.01

**(e) Year groups taken separately, by gender**

Lower school: F=6.54 df 1,102 p<0.01

Middle school: F=0.075 df 1,104 p<0.78

Upper school: F=14.29 df 1,128 p<0.01.

**Table 26: Means, Standard Deviations, Analysis of Variance:  
Alcohol Social Pressures**

Social Pressures (sum ASP: range 0 to +54)

**(a) All cases**

	All cases	
	n=355	
<hr/>		
	M   13.64	
	SD   9.00	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=172		n=183	
<hr/>					
	M	13.16		14.11	
	SD	9.00		9.01	
<hr/>					

F=0.99 df 1,353 p<0.32

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=115	n=110	n=130	
<hr/>					
	M	9.47	12.97	17.92	
	SD	6.97	8.40	9.26	
<hr/>					

F = 32.09 df 2,352 p<0.01

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower	Middle	Upper				Lower	Middle	Upper	
		n=54	n=49	n=69				n=61	n=61	n=61	
<hr/>											
	M	7.33	14.43	16.81				11.36	11.80	19.16	
	SD	5.41	8.13	9.62				7.65	8.48	8.74	
<hr/>											

F=21.72 df 2,169 p<0.01

F=16.99 df 2,180 p<0.01

**(e) Year groups taken separately by gender**

Lower school: F=10.36 df 1,113 p<0.01

Middle school: F= 2.71 df 1,108 p<0.10

Upper school: F= 2.12 df 1,128 p<0.15

## Preliminary comments on the Alcohol scale

### **Regression analysis**

Tables 23(a), (b), (c) show that a statistically significant amount of the variance in the Intentions of adolescents to drink alcohol is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (social approval in this case) they experience. All the F ratios for multiple regression are significant beyond the 1% level, except that for the middle school girls (Table 23(c)), which is significant at between the 1% and 5% level. Thus the Ajzen and Fishbein model is internally valid when applied to the Alcohol scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to drink alcohol. The influence of Beliefs is slightly greater than that of Social Pressures, except in the case of Upper School girls, for whom the latter have the greater influence.

### **Intentions**

Table 24(a) indicates that the mean Intention of young people to drink alcohol is only slight. It increases with age in both girls and boys and the difference between the means is significant 24(c), (d)).

Table 24(b) shows that the difference between the mean Intentions to drink alcohol of boys and girls overall is not significant. However the mean Intentions of the lower school boys are stronger than those of the lower school girls (Table 24(d) and the difference between their means is significant (Table 24(e)).

### **Beliefs**

Table 25(a) shows that mean Beliefs about drinking alcohol are generally negative. Table 25(c) shows that overall, mean Beliefs become less negative with increasing age. This is so in the case of both boys and girls (Table 25(d)) and the differences between their means is significant.

Table 25(b) shows that overall, girls' mean Beliefs about drinking alcohol are more negative than those of boys and the difference between their means is significant. However, Table 25(d) indicates that this is not so in the middle school where the difference between the means is not significant (Table 25(e)).

### **Social pressures**

Table 26(a) shows that the mean Social Approval reported by young people for drinking alcohol is not very strong. The mean Social Approval reported increases with age Table 26(c). This is so for both boys and girls (Table 26(d)) and the differences between their means is significant.

The mean Social Approval reported generally by boys and girls (Table 26(b)) is similar: the difference between their means is not significant. The exception to this is in the lower school, where the mean Social Approval reported by the boys is greater than that reported by the girls and the difference between their means is significant (Table 26(e)).

## Smoking scale

**Table 27: Regression analysis - Smoking scale**  
 sum SI(dependent variable) with sum SB and sum SSP

**(a) All cases and by gender**

	All cases	All Girls	All boys
No. of cases	342	176	166
SI with SB $r=$	0.43	0.50	0.37
SI with SSP $r=$	0.61	0.70	0.51
SB with SSP $r=$	0.39	0.39	0.38
Multiple $R=$	0.65	0.74	0.54
Multiple $R^2=$	0.42	0.55	0.29
F	121.97	105.87	33.73
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta SB	0.23	0.27	0.20
F	25.83	22.84	7.86
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta SSP	0.52	0.60	0.43
F	135.34	115.66	36.56
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$

**(b) By year group**

	All Cases		
	Lower	Middle	Upper
No. of cases	110	105	127
SI with SB $r=$	0.38	0.36	0.58
SI with SSP $r=$	0.68	0.48	0.61
SB with SSP $r=$	0.44	0.31	0.47
Multiple $R=$	0.69	0.53	0.70
Multiple $R^2=$	0.47	0.28	0.49
F	47.43	19.87	59.09
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta SB	0.10	0.24	0.38
F	1.70	7.11	26.93
Significance of F	ns	$p<0.01$	$p<0.01$
Beta SSP	0.63	0.41	0.44
F	65.33	21.38	36.49
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$

**(c) By gender and year group**

	Girls			Boys		
	Lower	Middle	Upper	Lower	Middle	Upper
No. of cases	53	55	68	57	50	59
SI with SB $r=$	0.40	0.40	0.65	0.39	0.30	0.49
SI with SSP $r=$	0.68	0.54	0.74	0.72	0.40	0.44
SB with SSP $r=$	0.44	0.25	0.50	0.44	0.37	0.42
Multiple $R=$	0.69	0.60	0.81	0.73	0.43	0.55
Multiple $R^2=$	0.47	0.36	0.66	0.53	0.19	0.30
F	22.23	14.79	62.92	30.53	5.43	12.21
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$
Beta SB	0.13	0.28	0.37	0.09	0.18	0.37
F	1.32	5.94	20.07	0.70	1.62	8.88
Significance of F	ns	$p<0.05$	$p<0.01$	ns	ns	$p<0.01$
Beta SSP	0.62	0.47	0.56	0.69	0.33	0.28
F	29.06	16.77	44.29	43.44	5.59	5.45
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.05$	$p<0.05$

**Table 28: Means, Standard Deviations, Analysis of Variance:  
Smoking Intentions**

(sum SI range 0 to +9)

**(a) All cases**

	All cases	
	n=356	
<hr/>		
M	1.42	
SD	2.64	
<hr/>		

**(b) By gender**

	Girls	Boys
	n=180	n=176
<hr/>		
M	1.83	1.01
SD	2.96	2.19
<hr/>		

F=8.85 df 1,354 p<0.01

**(c) By year groups**

	All cases		
	<hr/>		
	Lower	Middle	Upper
	n=116	n=110	n=130
<hr/>			
M	0.72	1.26	2.18
SD	1.60	2.49	3.25
<hr/>			

F = 10.32 df 2,353 p<0.01

**(d) By gender and by year groups**

	Girls				Boys		
	<hr/>				<hr/>		
	Lower	Middle	Upper		Lower	Middle	Upper
	n=56	n=56	n=68		n=60	n=54	n=62
<hr/>							
M	0.86	1.70	2.74		0.58	0.82	1.58
SD	1.76	2.90	3.50		1.44	1.89	2.85
<hr/>							

F=6.68 df 2,177 p<0.01

F=3.54 df 2,173 p<0.03

**(e) Year groups taken separately by gender**

Lower school: F=0.84 df 1,114 p<0.36

Middle school: F=3.53 df 1,108 p<0.06

Upper school: F=4.20 df 1,128 p<0.04

**Table 29: Means, Standard Deviations, Analysis of Variance:  
Smoking Beliefs**

(sum SB range -84 to +84)

**(a) All cases**

	All cases	
	n=342	
<hr/>		
	M   -18.27	
	SD   10.24	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=176		n=166	
<hr/>					
	M	-18.06		-18.49	
	SD	9.78		10.73	
<hr/>					

F=0.15 df 1,340 p<0.70

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=110		n=105	
		n=127			
<hr/>					
	M	-17.60		-18.85	
	SD	10.84		9.53	
				10.32	
<hr/>					

F = 0.41 df 2,339 p<0.67

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower		Middle		Upper		Lower		Middle	
		n=53		n=55		n=68		n=57		n=50	
		n=59						n=59			
<hr/>											
	M	-17.89		-18.04		-18.21		-17.33		-19.74	
	SD	8.95		9.35		10.83		12.42		9.74	
										9.80	
<hr/>											

F=0.02 df 2,173 p<0.98

F=0.67 df 2,163 p<0.51

**(e) Year groups taken separately by gender**

Lower School: F=0.07 df 1,108 p<0.79

Middle School: F=0.84 df 1,103 p<0.36

Upper School: F=0.03 df 1,125 p<0.85

**Table 30: Means, Standard Deviations, Analysis of Variance:  
Smoking Social Pressures**

Social Pressures (sum SSP: range 0 to +54)

**(a) All cases**

	All cases	
	n=353	
<hr/>		
	M   5.59	
	SD   7.20	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=178		n=175	
<hr/>					
	M	5.68		5.50	
	SD	7.33		7.08	
<hr/>					

F=0.05 df 1,351 p<0.82

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=114	n=109	n=130	
<hr/>					
	M	3.56		4.62	
	SD	5.77		5.62	
				8.18	
				8.63	
<hr/>					

F = 15.08 df 2,350 p<0.01

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower	Middle	Upper				Lower	Middle	Upper	
		n=54	n=56	n=68				n=60	n=53	n=62	
<hr/>											
	M	2.89		4.86				4.17		4.38	
	SD	5.16		5.84				6.26		5.42	
				8.81						8.48	
<hr/>											

F=10.60 df 2,175 p<0.01

F= 5.12 df 2,172 p<0.01

**(e) Year groups taken separately by gender**

Lower School: F=1.40 df 1,112 p<0.24

Middle School: F=0.20 df 1,107 p<0.66

Upper School: F=0.29 df 1,128 p<0.59



## Preliminary comments on Smoking scale

### **Regression analysis**

Tables 27(a),(b),(c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning smoking cigarettes, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (social approval in this case) they experience. The F ratios for multiple regression are all statistically significant beyond the 1% level. Multiple  $R^2$  for Middle School cases tends to be lower than for the corresponding Lower and Upper school cases. Multiple  $R^2$  for boys' cases is lower than for girls' cases (0.29 as opposed to 0.55). This indicates that the model is a better fit for girls than boys.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to smoke. With the exception of Upper School boys, Social Approval has a much stronger influence on smoking Intentions than Beliefs about smoking.

### **Intentions**

Table 28(a) indicates that the mean Intention of young people to smoke is slight. It increases with age in both girls and boys and the differences between the means are significant (Tables 28 (c),(d)).

In general, girls express a stronger mean Intention to smoke than boys (Table 28 (b) and the difference between their means is significant. However, Tables 28 (d),(e) show that there is a significant difference between the mean Intentions of girls and boys in the Upper School with respect to smoking but not between the mean Intentions of girls and boys in the Middle and Lower Schools.

### **Beliefs**

Table 29(a) shows that overall, mean Beliefs about smoking are negative.

There is no significant difference between the mean Beliefs of boys and girls about smoking (Table 29(b)), nor any significant change with increasing age (Table 29(c)).

### **Social pressures**

Table 30(a) shows that the mean Social Approval reported by young people for smoking is slight. It increases with age in both girls and boys and the differences between the means are significant (Tables 30(c),(d)).

There is no significant difference between the mean Social Approval (from parents and friends) reported by girls and boys with respect to smoking cigarettes (Table 30 (b),(e)).

## Keeping Fit

**Table 31: Regression analysis: Keeping Fit scale**  
 sum KI(dependent variable) with sum KB and sum KSP

<b>(a) All cases and by gender</b>		All cases	All Girls	All boys
No. of cases		360	180	180
KI with KB $r=$		0.51	0.56	0.48
KI with KSP $r=$		0.36	0.43	0.31
KB with KSP $r=$		0.37	0.39	0.36
Multiple $R=$		0.55	0.61	0.50
Multiple $R^2=$		0.30	0.37	0.25
F		75.64	51.72	29.30
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta KB		0.44	0.47	0.42
F		84.88	52.90	36.59
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta KSP		0.20	0.24	0.15
F		17.16	14.12	4.84
Significance of F		$p<0.01$	$p<0.01$	$p<0.05$

<b>(b) By year group</b>		All Cases		
		Lower	Middle	Upper
No. of cases		114	111	135
KI with KB $r=$		0.54	0.46	0.54
KI with KSP $r=$		0.40	0.41	0.28
KB with KSP $r=$		0.48	0.39	0.29
Multiple $R=$		0.57	0.52	0.56
Multiple $R^2=$		0.32	0.27	0.31
F		26.25	20.12	29.60
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta KB		0.45	0.35	0.50
F		25.91	15.66	44.72
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta KSP		0.19	0.27	0.13
F		4.41	9.26	3.01
Significance of F		$p<0.05$	$p<0.01$	ns

<b>(c) By gender and year group</b>		Girls			Boys		
		Lower	Middle	Upper	Lower	Middle	Upper
No. of cases		52	51	77	62	60	58
KI with KB $r=$		0.62	0.63	0.46	0.48	0.30	0.64
KI with KSP $r=$		0.41	0.53	0.35	0.40	0.33	0.20
KB with KSP $r=$		0.43	0.51	0.32	0.52	0.31	0.25
Multiple $R=$		0.64	0.68	0.51	0.51	0.39	0.64
Multiple $R^2=$		0.42	0.46	0.26	0.26	0.15	0.41
F		17.37	20.21	12.79	10.43	5.13	19.34
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$
Beta KB		0.55	0.48	0.39	0.38	0.26	0.63
F		20.42	15.26	13.66	8.39	4.10	35.11
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.05$	$p<0.01$
Beta KSP		0.18	0.29	0.22	0.20	0.22	0.04
F		2.26	5.54	4.37	2.30	3.03	0.14
Significance of F		ns	$p<0.05$	$p<0.05$	ns	ns	ns

**Table 32: Means, Standard Deviations, Analysis of Variance:  
Keeping Fit Intentions**

(sum KI range 0 to +9)

**(a) All cases**

	All cases	
	n=372	
<hr/>		
M	5.45	
SD	1.92	
<hr/>		

**(b) By gender**

	Girls	Boys
	n=185	n=187
<hr/>		
M	5.21	5.68
SD	1.95	1.87
<hr/>		

F=5.86 df 1,370 p<0.02

**(c) By year groups**

	All cases	
	<hr/>	
	Lower   Middle   Upper	
	n=119   n=117   n=136	
<hr/>		
M	5.57	5.26   5.50
SD	1.92	2.08   1.78
<hr/>		

F = 0.88 df 2,369 p<0.42

**(d) By gender and by year groups**

	Girls	Boys
	<hr/>	<hr/>
	Lower   Middle   Upper	Lower   Middle   Upper
	n=54   n=53   n=78	n=65   n=64   n=58
<hr/>		
M	5.43	4.66   5.42
SD	1.96	2.14   1.75
<hr/>		

F=2.97 df 2,182 p<0.06 | F=0.09 df 2,184 p<0.91

**(e) Year groups taken separately by gender**

Lower School: F=0.56 df 1,117 p<0.46

Middle School: F=8.50 df 1,115 p<0.01

Upper School: F=0.34 df 1,134 p<0.56

**Table 33: Means, Standard Deviations, Analysis of Variance:  
Keeping Fit Beliefs**

(sum KB range -48 to +48)

**(a) All cases**

	All cases	
	n=363	
<hr/>		
M	10.43	
SD	8.83	
<hr/>		

**(b) By gender**

	Girls	Boys	
	n=182	n=181	
<hr/>			
M	10.59	10.27	
SD	8.54	9.13	
<hr/>			

F=0.13 df 1,361 p<0.72

**(c) By year groups**

	All cases			
	<hr/>			
	Lower	Middle	Upper	
	n=115	n=113	n=135	
<hr/>				
M	10.25	9.21	11.60	
SD	8.62	8.22	9.39	
<hr/>				

F = 2.30 df 2,360 p<0.10

**(d) By gender and by year groups**

	Girls				Boys			
	<hr/>				<hr/>			
	Lower	Middle	Upper		Lower	Middle	Upper	
	n=53	n=52	n=77		n=62	n=61	n=58	
<hr/>								
M	10.17	8.83	12.08		10.32	9.54	10.97	
SD	8.11	8.49	8.70		9.10	8.03	10.27	
<hr/>								

F=2.38 df 2,179 p<0.10

F=0.36 df 2,178 p<0.70

**(e) Year groups taken separately by gender**

Lower School: F=0.01 df 1,113 p<0.93

Middle School: F=0.21 df 1,111 p<0.65

Upper School: F=0.46 df 1,133 p<0.50

**Table 34: Means, Standard Deviations, Analysis of Variance:  
Keeping Fit Social Pressures**

Social Pressures (sum KSP: range 0 to +54)

**(a) All cases**

	All cases	
	n=368	
<hr/>		
	M   15.51	
	SD   8.63	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=183		n=185	
<hr/>					
	M	15.45		15.57	
	SD	8.31		8.95	
<hr/>					
F=0.18 df 1,366 p<0.89					

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=118	n=114	n=136	
<hr/>					
	M	17.69	14.01	14.89	
	SD	10.04	7.49	7.85	
<hr/>					
F = 5.99 df 2,365 p<0.01					

**(d) By gender and by year groups**

		Girls					Boys			
		<hr/>					<hr/>			
		Lower	Middle	Upper			Lower	Middle	Upper	
		n=53	n=52	n=78			n=65	n=62	n=58	
<hr/>										
	M	17.70	13.50	15.23			17.68	14.44	14.43	
	SD	10.22	6.48	7.68			9.97	8.28	8.12	
<hr/>										
F=3.49 df 2,180 p<0.03      F=2.82 df 2,182 p<0.06										

**(e) Year groups taken separately by gender**

Lower School: F=0.00 df 1,116 p<0.99  
 Middle School: F=0.44 df 1,112 p<0.51  
 Upper School: F=0.34 df 1,134 p<0.56

## **Preliminary comments on the Keeping Fit scale**

### ***Regression Analyses***

Tables 31(a), (b), (c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning keeping fit, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (social expectations in this case) they experience. All the F ratios for multiple regression are significant beyond the 1% level. Thus the Ajzen and Fishbein model is internally valid when applied to the Keeping Fit scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to keep fit. In all cases, the influence of Beliefs on Intentions to keep fit is much greater than that of Social Pressures.

### ***Intentions***

Table 31(a) shows that overall, mean Intentions of young people to keep fit are fairly strong.

The mean Intention of boys to Keep Fit is stronger than that of girls overall (Table 32(b)) and the difference between the means is significant. However, Table 32(e) shows that this is so in the Middle School only.

There is no significant change with age in the mean Intention to keep fit (Table 32(c), (d)).

### ***Beliefs***

Table 33(a) shows that overall, mean Beliefs about Keeping Fit are positive.

Mean Beliefs about keeping fit are similar for girls and boys and there is little change with age. The differences between the means are not significant (Tables 33(b), (c), (d), (e)).

### ***Social pressures***

Table 34(a) shows that the mean social pressure reported by young people to keep fit is not very strong.

There is no significant difference between the mean social pressures reported by girls and boys, concerning keeping fit (Table 34(b), (d)).

The mean Social Pressures to keep fit reported by pupils in the Middle and Upper Schools are less than those reported by pupils in the Lower School (Table 34(c)) and the difference between the means is significant. Table 34(d) shows that this is true for girls but not for boys.

## Diet sub-scale: Protein

**Table 35: Regression analysis: Diet - Protein sub-scale**  
 sum DPI(dependent variable) with sum DPB and sum DPSP

(a) All cases and by gender	All cases	All Girls	All boys
No. of cases	353	192	161
DPI with DPB r=	0.30	0.42	0.15
DPI with DPSP r=	0.21	0.23	0.19
DPB with DPSP r=	0.37	0.29	0.46
Multiple R=	0.32	0.44	0.20
Multiple R <sup>2</sup> =	0.10	0.19	0.04
F	19.57	22.35	3.45
Significance of F	p<0.01	p<0.01	p<0.05
Beta DPB	0.25	0.39	0.07
F	21.33	32.07	0.73
Significance of F	p<0.01	p<0.01	ns
Beta DPSP	0.12	0.12	0.16
F	4.97	3.10	3.30
Significance of F	p<0.05	ns	ns

(b) By year group	All Cases		
	Lower	Middle	Upper
No. of cases	111	112	130
DPI with DPB r=	0.26	0.28	0.24
DPI with DPSP r=	0.23	0.27	0.20
DPB with DPSP r=	0.42	0.32	0.42
Multiple R=	0.29	0.34	0.26
Multiple R <sup>2</sup> =	0.08	0.11	0.07
F	4.89	6.84	4.86
Significance of F	p<0.01	p<0.01	p<0.05
Beta DPB	0.19	0.22	0.19
F	3.65	5.08	4.11
Significance of F	ns	p<0.05	p<0.05
Beta DPSP	0.15	0.20	0.12
F	2.12	4.19	1.49
Significance of F	ns	p<0.05	ns

(c) By gender and year group	Girls			Boys		
	Lower	Middle	Upper	Lower	Middle	Upper
No. of cases	63	54	75	48	58	55
DPI with DPB r=	0.39	0.44	0.33	0.07	0.14	0.12
DPI with DPSP r=	0.32	0.21	0.18	0.12	0.33	0.25
DPB with DPSP r=	0.39	0.22	0.30	0.46	0.41	0.57
Multiple R=	0.43	0.45	0.35	0.13	0.33	0.25
Multiple R <sup>2</sup> =	0.19	0.21	0.12	0.07	0.11	0.06
F	6.91	6.57	4.87	0.36	6.94	1.75
Significance of F	p<0.01	p<0.01	p<0.05	p>0.05	p<0.01	p>0.05
Beta DPB	0.32	0.41	0.31	0.02	none	-0.03
F	6.26	10.34	7.04	0.01	none	0.04
Significance of F	p<0.05	p<0.01	p<0.01	ns	ns	ns
Beta DPSP	0.20	0.12	0.09	0.11	0.33	0.27
F	2.45	0.88	0.61	0.47	6.94	2.70
Significance of F	ns	ns	ns	ns	p<0.05	ns

**Table 36: Means, Standard Deviations, Analysis of Variance:  
Diet - Protein Intentions**

(sum DPI range 0 to +3)

**(a) All cases**

	All cases	
	n=366	
<hr/>		
M	2.53	
SD	0.66	
<hr/>		

**(b) By gender**

	Girls		Boys	
	n=196		n=170	
<hr/>				
M	2.55		2.52	
SD	0.67		0.66	
<hr/>				

F=0.16 df 1,364 p<0.69

**(c) By year groups**

		All cases					
		<hr/>					
		Lower		Middle		Upper	
		n=117		n=117		n=132	
		<hr/>					
M		2.34		2.48		2.75	
SD		0.70		0.70		0.53	
		<hr/>					

F = 13.09 df 2,363 p<0.01

**(d) By gender and by year groups**

Girls				Boys			
	Lower	Middle	Upper		Lower	Middle	Upper
	n=65	n=56	n=75		n=52	n=61	n=57
M	2.38	2.48	2.73		2.29	2.48	2.77
SD	0.72	0.74	0.50		0.67	0.67	0.57

F=5.36 df 2,193 p<0.01

F=8.02 df 2,167 p<0.01

**(e) Year groups taken separately, by gender**

Lower School: F=0.55 df 1,115 p<0.46

Middle School: F=0.003 df 1,116 p<0.96

Upper School: F=0.17 df 1,131 p<0.68



**Table 37: Means, Standard Deviations, Analysis of Variance:  
Diet - Protein Beliefs**

(sum DPB range -18 to +18)

**(a) All cases**

	All cases	
	n=362	
<hr/>		
	M   7.51	
	SD   4.34	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=194		n=168	
<hr/>					
	M	7.27		7.78	
	SD	4.42		4.24	
<hr/>					

F=1.25 df 1,360 p<0.26

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=115	n=115	n=132	
<hr/>					
	M	6.45	7.51	8.42	
	SD	4.36	4.52	3.98	
<hr/>					

F = 6.48 df 2,359 p<0.01

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower	Middle	Upper				Lower	Middle	Upper	
		n=64	n=55	n=75				n=51	n=60	n=57	
<hr/>											
	M	6.05	6.91	8.57				6.96	8.07	8.21	
	SD	4.37	4.95	3.74				4.38	4.04	4.30	
<hr/>											

F=6.21 df 2,191 p<0.01

F=1.39 df 2,165 p<0.25

**(e) Year groups taken separately, by gender**

Lower School: F=1.25 df 1,113 p<0.27

Middle School: F=1.90 df 1,114 p<0.17

Upper School: F=0.27 df 1,130 p<0.61

**Table 38: Means, Standard Deviations, Analysis of Variance:  
Diet: Protein Social Pressures**

Social Pressures (sum DPSP: range 0 to +9)

**(a) All cases**

	All cases	
	n=358	
<hr/>		
	M   4.44	
	SD   2.23	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=194		n=164	
<hr/>					
	M	4.37		4.49	
	SD	2.34		2.14	
<hr/>					

F=0.25 df 1,356 p<0.62

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=114		n=114	
				Upper	
				n=130	
<hr/>					
	M	4.73		4.05	
	SD	2.39		2.15	
				2.12	
<hr/>					

F = 2.77 df 2,355 p<0.06

**(d) By gender and by year groups**

Girls				Boys			
	Lower	Middle	Upper		Lower	Middle	Upper
	n=64	n=55	n=75		n=50	n=59	n=55
M	4.83	3.80	4.71		4.60	4.29	4.25
SD	2.18	2.04	2.09		2.66	2.24	2.14

F=4.17 df 2,191 p<0.02

F=0.34 df 2,161 p<0.71

**(e) Year groups taken separately, by gender**

Lower School: F=0.25 df 1,112 p<0.62

Middle School: F=1.47 df 1,112 p<0.23

Upper School: F=1.45 df 1,128 p<0.23

## **Preliminary comments on the Diet: Protein sub-scale**

### ***Regression analyses***

Tables 35(a), (b), (c) show that the values of  $R^2$  in these analyses are small. Even so, a statistically significant amount of the variance in the Intentions of adolescents concerning eating protein is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (parental pressures in this case) they experience. The F ratios for multiple regression for more than half of these analyses are significant beyond the 1% level. For 'all cases in the Upper School', 'all boys' and 'Upper School girls' they are significant between the 1% and 5% level. Analysis of data from 'Lower School boys' and 'Upper School boys' gives F ratios for multiple regression that are not significant at the 5% level. In general the Ajzen and Fishbein model is internally valid in respect of Diet - protein.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to eat foods rich in protein. Overall and for Girls taken separately, the influence of Beliefs is greater than that of Social Pressures, but for Boys taken separately neither has a significant influence.

### ***Intentions***

Table 36(a) shows that overall, the expressed Intentions to eat protein are strong. The difference between the mean Intentions to eat protein of boys and girls is not significant (Tables 36(b), (d), (e)).

The Intention to eat Protein increases only slightly with age in both boys and girls, although the difference between the means is significant (Tables 36(c), (d), (e)).

### ***Beliefs***

Table 37(a) shows that overall, mean Beliefs about eating protein are positive. The difference between the mean Beliefs of boys and girls is not significant (Table 37(b), (d), (e)).

Mean Beliefs about eating protein become more positive with increasing age and the difference between the means is significant (Table 37(c). Table 37(d), however, reveals that the latter is true for girls only.

### ***Social pressures***

Table 38(a) shows that overall the mean Parental Pressures with respect to eating protein, reported by young people, is fairly firm. The difference between the mean Parental Pressures reported by boys and girls is not significant (Table 38(b), (d), (e)).

Table 38(c) shows that the mean Parental Pressure reported by the different age groups is similar and the differences amongst the means are not significant. Table 38(d), (e), however, reveals that the differences amongst the means for the girls are significant.

***Social Pressures from parents only were measured for Diet.***

## Diet sub-scale: Fibre

**Table 39: Regression analysis: Diet - Fibre sub-scale**  
 sum DFI(dependent variable) with sum DFB and sum DFSP

(a) All cases and by gender		All cases	All Girls	All boys
No. of cases		352	194	158
DFI with sum DFB $r=$		0.51	0.54	0.50
DFI with DFSP $r=$		0.49	0.51	0.46
DFB with DFSP $r=$		0.45	0.43	0.46
Multiple $R=$		0.59	0.62	0.56
Multiple $R^2=$		0.35	0.39	0.32
F		92.56	56.68	36.06
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DFB		0.37	0.39	0.36
F		58.84	38.45	23.13
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DFSP		0.32	0.34	0.30
F		44.13	29.82	16.02
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$

(b) By year group		All Cases		
		Lower	Middle	Upper
No. of cases		111	111	130
DFI with DFB $r=$		0.58	0.61	0.38
DFI with DFSP $r=$		0.53	0.47	0.48
DFB with DFSP $r=$		0.40	0.42	0.54
Multiple $R=$		0.66	0.66	0.50
Multiple $R^2=$		0.44	0.43	0.25
F		42.20	41.45	21.37
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DFB		0.44	0.50	0.17
F		31.05	39.98	3.63
Significance of F		$p<0.01$	$p<0.01$	ns
Beta DFSP		0.35	0.27	0.39
F		20.14	11.09	17.90
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$

(c) By gender and year group		Girls			Boys		
		Lower	Middle	Upper	Lower	Middle	Upper
No. of cases		64	55	75	47	56	55
DFI with DFB $r=$		0.66	0.59	0.41	0.50	0.64	0.35
DFI with DFSP $r=$		0.61	0.36	0.53	0.45	0.55	0.41
DFB with DFSP $r=$		0.47	0.20	0.53	0.31	0.41	0.56
Multiple $R=$		0.74	0.64	0.55	0.59	0.69	0.44
Multiple $R^2=$		0.54	0.41	0.31	0.35	0.47	0.19
F		36.38	18.09	15.96	11.68	23.87	6.18
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$
Beta DFB		0.47	0.54	0.18	0.40	0.49	0.17
F		23.18	24.77	2.37	9.7	17.45	1.32
Significance of F		$p<0.01$	$p<0.01$	ns	$p<0.01$	$p<0.01$	ns
Beta DFSP		0.38	0.25	0.44	0.32	0.29	0.32
F		15.37	5.47	14.33	6.23	6.00	4.42
Significance of F		$p<0.01$	$p<0.05$	$p<0.01$	$p<0.05$	$p<0.05$	$p<0.05$

**Table 40: Means, Standard Deviations, Analysis of Variance:  
Diet - Fibre Intentions**

(sum DFI range 0 to +3)

**(a) All cases**

	All cases	
	n=366	
<hr/>		
M	1.64	
SD	1.08	
<hr/>		

**(b) By gender**

	Girls	Boys
	n=196	n=170
<hr/>		
M	1.62	1.65
SD	1.05	1.12
<hr/>		

F=0.07 df 1,364 p<0.79

**(c) By year groups**

	All cases		
	<hr/>		
	Lower	Middle	Upper
	n=117	n=117	n=132
<hr/>			
M	1.60	1.62	1.69
SD	1.03	1.15	1.06
<hr/>			

F = 0.25 df 2,363 p<0.78

**(d) By gender and by year groups**

	Girls				Boys		
	<hr/>				<hr/>		
	Lower	Middle	Upper		Lower	Middle	Upper
	n=65	n=56	n=75		n=52	n=61	n=57
<hr/>							
M	1.65	1.54	1.67		1.54	1.69	1.72
SD	1.01	1.09	1.06		1.06	1.20	1.08
<hr/>							

F=0.27 df 2,193 p<0.76

F=0.40 df 2,167 p<0.67

**(e) Year groups taken separately, by gender**

Lower School: F=0.32 df 1,115 p<0.58

Middle School: F=0.51 df 1,115 p<0.48

Upper School: F=0.08 df 1,130 p<0.78

**Table 41: Means, Standard Deviations, Analysis of Variance:  
Diet - Fibre Beliefs**

(sum DFB range -18 to +18)

**(a) All cases**

	All cases	
	n=359	
<hr/>		
M	2.77	
SD	5.24	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=195		n=164	
<hr/>					
M		2.02		3.66	
SD		5.14		5.24	
<hr/>					

F=8.95 df 1,357 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=113	n=114	n=132	
<hr/>					
M		2.24	2.39	3.55	
SD		5.06	5.17	5.40	
<hr/>					

F = 2.35 df 2,356 p<0.10

**(d) By gender and by year groups**

		Girls					Boys			
		<hr/>					<hr/>			
		Lower	Middle	Upper			Lower	Middle	Upper	
		n=64	n=56	n=75			n=49	n=58	n=57	
<hr/>										
M		1.52	1.11	3.12			3.18	3.62	4.11	
SD		5.14	4.98	5.13			4.84	5.10	5.74	
<hr/>										

F=2.97 df 2,192 p<0.05

F=0.41 df 2,161 p<0.67

**(e) Year groups taken separately, by gender**

Lower School: F=3.08 df 1,111 p<0.08

Middle School: F=7.10 df 1,112 p<0.01

Upper School: F=1.08 df 1,130 p<0.30

**Table 42: Means, Standard Deviations, Analysis of Variance:  
Diet - Fibre Social Pressures**

Social Pressures (sum DFSP: range 0 to +9)

**(a) All cases**

	All cases	
	n=358	
<hr/>		
	M   3.32	
	SD   2.38	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=194		n=164	
<hr/>					
	M	3.24		3.42	
	SD	2.19		2.58	
<hr/>					

F=0.50 df 1,356 p<0.48

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=114	n=114	n=130	
<hr/>					
	M	3.70	2.97	3.28	
	SD	2.53	2.22	2.33	
<hr/>					

F = 2.72 df 2,355 p<0.07

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower	Middle	Upper				Lower	Middle	Upper	
		n=64	n=55	n=75				n=50	n=59	n=55	
<hr/>											
	M	3.66	2.62	3.33				3.76	3.31	3.22	
	SD	2.33	1.75	2.29				2.80	2.55	2.42	
<hr/>											

F=3.52 df 2,191 p<0.03

F=0.66 df 2,161 p<0.52

**(e) Year groups taken separately, by gender**

Lower School: F=0.05 df 1,112 p<0.83

Middle School: F=2.77 df 1,112 p<0.10

Upper School: F=0.08 df 1,128 p<0.78

## Preliminary comments on Diet: Fibre Sub-scale

### **Regression analyses**

Tables 39(a), (b), (c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning eating fibre, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (parental pressure in this case) they experience. The F ratios for multiple regression are all statistically significant beyond the 1% level. The multiple  $R^2$  for Upper School analyses is noticeably less than those from the Middle and Lower Schools. Thus the Ajzen and Fishbein model appears internally valid when applied to the Diet - fibre sub-scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to eat foods rich in fibre. With the exception of pupils in the Upper School, the influence of Beliefs is greater than that of Social Pressures. In the Upper School, Social Pressures have the stronger influence.

### **Intentions**

Table 40(a) indicates that overall, the mean Intentions of young people to eat fibre is not strong. Tables 40(b), (d), (e) shows that the difference between mean Intentions to eat fibre of boys and girls is not significant at any age level.

The mean Intentions of the different age groups to eat fibre are similar and there is no significant difference amongst these means (Tables 40(c), (d)).

### **Beliefs**

Table 41(a) shows that overall, mean Beliefs about eating fibre are only slightly positive. Table 41(b) shows that the mean Beliefs of boys about eating fibre are more positive than those of girls, and the difference between the means is significant. However, Tables 41(d), (e) show that this latter is only so for the Middle School.

The mean Beliefs of the different age groups to eat fibre are similar and there is no significant difference amongst these means (Table 41(c)).

### **Social pressures**

Table 42(a) shows that the mean Parental Pressure to eat fibre reported by young people is not very strong. The difference between the mean Social Pressures reported by girls and boys is not significant (Table 42(b), (d), (e)).

The mean Parental Pressures to eat fibre, reported by the different age groups, is similar and there is no significant difference amongst the means (Table 42(c)). However, Table 42(d) reveals that in the case of girls the differences amongst the means are significant.



## Diet sub-scale: Salt

**Table 43: Regression analysis: Diet - Salt sub-scale**  
 sum DSI(dependent variable) with sum DSB and sum DSSP

**(a) All cases and  
by gender**

	All cases	All Girls	All boys
No. of cases	350	193	157
DSI with DSB $r=$	0.45	0.48	0.40
DSI with DSSP $r=$	0.35	0.36	0.33
DSB with DSSP $r=$	0.22	0.21	0.24
Multiple $R=$	0.52	0.55	0.46
Multiple $R^2=$	0.27	0.30	0.22
F	63.16	40.66	21.17
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DSB	0.39	0.42	0.34
F	70.12	45.29	20.92
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DSSP	0.26	0.28	0.25
F	29.79	20.02	11.71
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$

**(b) By year group**

	All Cases		
	Lower	Middle	Upper
No. of cases	110	110	130
DSI with DSB $r=$	0.41	0.47	0.45
DSI with DSSP $r=$	0.38	0.29	0.39
DSB with DSSP $r=$	0.19	0.23	0.25
Multiple $R=$	0.51	0.51	0.53
Multiple $R^2=$	0.26	0.26	0.28
F	19.17	18.69	24.82
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DSB	0.35	0.43	0.37
F	17.26	25.28	23.19
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DSSP	0.31	0.19	0.29
F	13.84	5.00	14.05
Significance of F	$p<0.01$	$p<0.05$	$p<0.01$

**(c) By gender and  
year group**

	Girls			Boys		
	Lower	Middle	Upper	Lower	Middle	Upper
No. of cases	63	55	75	47	55	55
DSI with DSB $r=$	0.38	0.43	0.58	0.44	0.48	0.18
DSI with DSSP $r=$	0.38	0.30	0.42	0.39	0.24	0.35
DSB with DSSP $r=$	0.27	0.17	0.19	0.13	0.25	0.35
Multiple $R=$	0.48	0.49	0.66	0.55	0.49	0.36
Multiple $R^2=$	0.23	0.24	0.44	0.31	0.24	0.13
F	9.09	8.32	28.17	9.70	8.30	3.78
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.05$
Beta DSB	0.30	0.39	0.52	0.40	0.45	0.06
F	6.59	10.36	33.44	9.85	12.80	0.20
Significance of F	$p<0.05$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	ns
Beta DSSP	0.31	0.23	0.32	0.34	0.12	0.33
F	6.77	3.56	12.96	7.14	0.98	5.71
Significance of F	$p<0.05$	ns	$p<0.01$	$p<0.05$	ns	$p<0.05$

**Table 44: Means, Standard Deviations, Analysis of Variance:  
Diet - Salt Intentions**

(sum DSI range 1 to +3)

**(a) All cases**

	All cases	
	n=365	
<hr/>		
M	1.25	
SD	1.07	
<hr/>		

**(b) By gender**

	Girls		Boys	
	n=195		n=170	
<hr/>				
M	1.04		1.48	
SD	1.00		1.09	
<hr/>				

F=16.21 df 1,363 p<0.01

**(c) By year groups**

	All cases			
	<hr/>			
	Lower	Middle	Upper	
	n=117	n=116	n=132	
<hr/>				
M	1.15	1.28	1.31	
SD	1.03	1.12	1.05	
<hr/>				

F = 0.81 df 2,362 p<0.45

**(d) By gender and by year groups**

	Girls				Boys			
	<hr/>				<hr/>			
	Lower	Middle	Upper		Lower	Middle	Upper	
	n=64	n=56	n=75		n=53	n=60	n=57	
<hr/>								
M	1.05	1.00	1.07		1.26	1.53	1.63	
SD	0.84	1.13	1.03		1.21	1.07	0.99	
<hr/>								

F=0.07 df 2,192 p<0.93

F=1.66 df 2,167 p<0.19

**(e) Year groups taken separately, by gender**

Lower School: F=1.30 df 1,115 p<0.26

Middle School: F=6.86 df 1,114 p<0.01

Upper School: F=10.03 df 1,130 p<0.01

**Table 45: Means, Standard Deviations, Analysis of Variance:  
Diet - Salt Beliefs**

(sum DSB range -12 to +12)

**(a) All cases**

	All cases	
	n=357	
<hr/>		
M	-1.92	
SD	4.00	
<hr/>		

**(b) By gender**

	Girls	Boys
	n=195	n=162
<hr/>		
M	-2.39	-1.35
SD	4.00	3.93
<hr/>		

F=6.13 df 1,355 p<0.01

**(c) By year groups**

	All cases		
	<hr/>		
	Lower	Middle	Upper
	n=115	n=112	n=130
<hr/>			
M	-2.30	-2.07	-1.44
SD	4.18	4.02	3.79
<hr/>			

F = 1.56 df 2,354 p<0.21

**(d) By gender and by year groups**

	Girls				Boys		
	<hr/>				<hr/>		
	Lower	Middle	Upper		Lower	Middle	Upper
	n=65	n=55	n=75		n=50	n=57	n=55
<hr/>							
M	-2.54	-2.69	-2.04		-2.00	-1.48	-0.62
SD	3.94	4.35	3.81		4.50	3.61	3.62
<hr/>							

F=0.49 df 2,192 p<0.62

F=1.68 df 2,159 p<0.19

**(e) Year groups taken separately, by gender**

Lower School: F=0.47 df 1,113 p<0.50

Middle School: F=2.61 df 1,110 p<0.11

Upper School: F=4.60 df 1,128 p<0.03

**Table 46: Means, Standard Deviations, Analysis of Variance:  
Diet - Salt Social Pressures**

Social Pressures (sum DSSP: range 0 to +9)

**(a) All cases**

	All cases	
	n=356	
<hr/>		
	M   1.44	
	SD   1.57	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=194		n=162	
<hr/>					
	M	1.39		1.51	
	SD	1.43		1.72	
<hr/>					

F=0.47 df 1,354 p<0.49

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=113		n=113	
				Upper	
				n=130	
<hr/>					
	M	1.47		1.36	
	SD	1.76		1.60	
				1.36	
<hr/>					

F = 0.23 df 2,353 p<0.80

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower		Middle		Upper		Lower		Middle	
		n=64		n=55		n=75		n=49		n=58	
<hr/>											
	M	1.61		1.05		1.45		1.29		1.66	
	SD	1.58		1.25		1.39		1.97		1.84	
<hr/>											

F=2.38 df 2,191 p<0.10

F=0.63 df 2,159 p<0.53

**(e) Year groups taken separately, by gender**

Lower School: F=0.94 df 1,111 p<0.33

Middle School: F=4.07 df 1,111 p<0.05

Upper School: F=0.15 df 1,128 p<0.70

**Preliminary comments Diet: Salt sub-scale*****Regression analysis***

Tables 43(a),(b),(c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning eating salt, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (parental pressure in this case) they experience. All the F ratios for multiple regression are statistically significant beyond the 1% level, with the exception of that for Upper School boys, which is significant between the 1% and the 5% level. Thus the Ajzen and Fishbein model appears internally valid when applied to the Diet - salt sub-scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to add extra salt to their food. The influence of Beliefs is greater than that of Social Pressures, except in the case of Upper School boys, for whom the latter have the greater influence.

***Intentions***

Table 44(a) shows that overall, the mean Intentions of young people to eat extra salt are not very strong. Table 44(b) shows that the mean Intentions of boys to eat extra salt is greater than that for girls and the difference between the means is significant. Tables 44(d),(e) however, indicate that the latter is true in the Middle and Upper Schools only.

The mean Intentions of the different age groups to eat salt are similar and there is no significant difference amongst these means (Table 44(c)).

***Beliefs***

Table 45(a) shows that overall, mean Beliefs about eating extra salt are generally negative. Table 45(b) shows that girls' mean Beliefs are more negative than those of boys and the difference between the means is significant. Tables 45(d),(e) however, indicate that the latter is true in the Upper School only.

The mean Beliefs of the different age groups to eat salt are similar and there is no significant difference amongst these means (Table 45(c)).

***Social pressures***

Table 46(a) shows that the mean Parental Pressures to eat salt, reported by young people, is not at all strong. The difference between the mean Social Pressures reported by girls and boys is not significant (Table 46(b)), although this is not true for the girls and boys in the Middle School where the difference between the means is significant (Tables 46(d),(e)).

The mean Parental Pressures to eat salt reported by the different age groups, is similar and there is no significant difference amongst the means (Table 48(c)).

## Diet sub-scale: Greens and Fruit

Table 47: Regression analysis: Diet - green vegetables, salads and fruit sub-scale

sum DGI (dependent variable) with sum DGB and sum DGSP

## (a) All cases and by gender

	All cases	All Girls	All boys
No. of cases	351	193	158
DGI with DGB $r=$	0.52	0.41	0.59
DGI with DGSP $r=$	0.37	0.35	0.38
DGB with DGSP $r=$	0.35	0.31	0.39
Multiple $R=$	0.56	0.47	0.61
Multiple $R^2$	0.31	0.22	0.38
F	76.34	26.74	46.76
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DGB	0.44	0.33	0.52
F	85.39	24.51	57.55
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DGSP	0.21	0.24	0.18
F	19.56	12.62	6.64
Significance of F	$p<0.01$	$p<0.01$	$p<0.05$

## (b) By year group

	All Cases		
	Lower	Middle	Upper
No. of cases	113	110	128
DGI with DGB $r=$	0.53	0.53	0.48
DGI with DGSP $r=$	0.35	0.39	0.39
DGB with DGSP $r=$	0.41	0.33	0.38
Multiple $R=$	0.55	0.58	0.53
Multiple $R^2$	0.30	0.33	0.28
F	23.71	26.47	24.47
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DGB	0.46	0.44	0.39
F	28.08	28.11	22.63
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DGSP	0.16	0.25	0.24
F	3.33	8.70	8.73
Significance of F	ns	$p<0.01$	$p<0.01$

## (c) By gender and year group

	Girls			Boys		
	Lower	Middle	Upper	Lower	Middle	Upper
No. of cases	64	55	74	49	55	54
DGI with DGB $r=$	0.42	0.43	0.39	0.58	0.61	0.56
DGI with DGSP $r=$	0.34	0.23	0.43	0.34	0.56	0.31
DGB with DGSP $r=$	0.45	0.23	0.34	0.37	0.50	0.37
Multiple $R=$	0.45	0.45	0.50	0.60	0.68	0.57
Multiple $R^2$	0.20	0.20	0.25	0.36	0.46	0.32
F	7.77	6.43	11.99	12.74	22.28	12.20
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$
Beta DGB	0.33	0.39	0.27	0.53	0.44	0.52
F	6.56	9.48	6.27	17.41	14.15	17.28
Significance of F	$p<0.05$	$p<0.01$	$p<0.05$	$p<0.01$	$p<0.01$	$p<0.01$
Beta DGSP	0.20	0.14	0.34	0.14	0.34	0.11
F	2.38	1.61	9.56	1.25	8.41	0.86
Significance of F	ns	ns	$p<0.01$	ns	$p<0.01$	ns

**Table 48: Means, Standard Deviations, Analysis of Variance:  
Diet - Green vegetables, salads and fruit Intentions.**

(sum DGI range 1 to +9)

**(a) All cases**

All cases		
n=365		
M	6.13	
SD	1.89	

**(b) By gender**

Girls		Boys	
n=196		n=169	
M	6.40	5.82	
SD	1.76	1.99	
F=8.43 df 1,363 p<0.01			

**(c) By year groups**

All cases			
Lower	Middle	Upper	
n=117	n=116	n=132	
M	6.03	5.98	6.35
SD	1.90	1.99	1.78
F = 1.42 df 2,362 p<0.24			

**(d) By gender and by year groups**

Girls				Boys			
	Lower	Middle	Upper		Lower	Middle	Upper
	n=65	n=56	n=75		n=52	n=60	n=57
M	6.42	6.13	6.57		5.54	5.85	6.05
SD	1.67	1.92	1.72		2.08	2.06	1.84
F=1.05 df 2,193 p<0.35				F=0.91 df 2,166 p<0.40			

**(e) Year groups taken separately, by gender**

Lower school: F=6.41 df 1,115 p<0.01  
 Middle School: F=0.55 df 1,114 p<0.46  
 Upper School: F=2.80 df 1,130 p<0.10

**Table 49: Means, Standard Deviations, Analysis of Variance:  
Diet - Green vegetables, salads and fruit Beliefs.**

(sum DGB range -42 to +42)

**(a) All cases**

	All cases	
	n=362	
<hr/>		
	M   16.90	
	SD   9.34	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=196		n=166	
<hr/>					
	M	19.09		14.31	
	SD	8.95		9.16	
<hr/>					

F=25.02 df 1,360 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=117		n=114	
		n=131			
<hr/>					
	M	15.00		16.81	
	SD	9.31		9.10	
				9.31	
<hr/>					

F = 4.88 df 2,359 p<0.01

**(d) By gender and by year groups**

Girls				Boys		
	Lower	Middle	Upper	Lower	Middle	Upper
	n=65	n=56	n=75	n=52	n=58	n=56
M	17.34	18.64	20.93	12.08	15.03	15.64
SD	8.53	9.17	8.92	9.49	8.75	9.03

F=2.96 df 2,193 p<0.06

F=2.36 df 2,163 p<0.10

**(e) Year groups taken separately, by gender**

Lower School: F=9.94 df 1,115 p<0.01

Middle School: F=4.62 df 1,112 p<0.03

Upper School: F=11.17 df 1,129 p<0.01



**Table 50: Means, Standard Deviations, Analysis of Variance:  
Diet - Green vegetables, salads and fruit Social Pressures.**

Social Pressures (sum DGSP: range 0 to +27)

**(a) All cases**

	All cases	
	n=357	
<hr/>		
	M   12.06	
	SD   6.22	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=193		n=164	
<hr/>					
	M	12.38		11.68	
	SD	5.97		6.51	
<hr/>					

F=1.11 df 1,355 p<0.29

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=114	n=114	n=129	
<hr/>					
	M	13.32	10.84	12.02	
	SD	6.66	5.83	5.98	
<hr/>					

F = 4.64 df 2,354 p<0.01

**(d) By gender and by year groups**

		Girls					Boys			
		<hr/>					<hr/>			
		Lower	Middle	Upper			Lower	Middle	Upper	
		n=64	n=55	n=74			n=50	n=59	n=55	
<hr/>										
	M	13.86	10.24	12.96			12.64	11.41	11.11	
	SD	5.87	5.67	5.88			7.55	5.97	6.05	
<hr/>										

F=5.91 df 2,190 p<0.01

F=0.81 df 2,161 p<0.45

**(e) Year groups taken separately, by gender**

Lower School: F=0.94 df 1,112 p<0.33

Middle School: F=1.15 df 1,112 p<0.29

Upper School: F=2.22 df 1,127 p<0.14

## Preliminary comments Diet: Greens and Fruit sub-scale

### **Regression analysis**

Tables 47(a), (b), (c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning eating green vegetables, salad and fruit, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (parental pressure in this case) they experience. The F ratios for multiple regression are all statistically significant beyond the 1% level. Thus the Ajzen and Fishbein model is internally valid when applied to the Diet - green vegetables, salads and fruit sub-scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to eat green vegetables, salads and fruit. The influence of Beliefs is greater than that of Social Pressures, except in the case of Upper School girls, for whom the latter have a slightly greater influence.

### **Intentions**

Table 48(a) shows that overall mean Intentions to eat green vegetables, salads and fruit are strong. The mean Intentions of girls is stronger for that of boys and the difference between the means is significant (Table 48(b)). Tables 48(d), (e) however, show that the difference between the means is significant for girls and boys in the Lower School only.

The mean Intentions of the different age groups to eat green vegetables, salads and fruit are similar and there is no significant difference amongst these means (Table 48(c)).

### **Beliefs**

Table 49(a) shows that overall, mean Beliefs about eating green vegetables, salads and fruit are positive. Tables 49(b), (d), (e) indicates that girls' mean Beliefs are more positive than those of boys and the differences between the means are significant at all age levels.

Mean Beliefs become more positive with increasing age and the differences amongst the means is significant (Table 49(c)).

### **Social pressures**

Table 50(a) shows that, overall the mean Parental Pressures with respect to eating green vegetables, salad and fruit, reported by young people, are quite strong. The difference between the mean Parental Pressures reported by boys and girls is not significant (Tables 50(b), (d), (e)).

The mean Parental Pressure reported by the different age groups varies, that of the Middle School being less than the Lower and Upper Schools: the difference amongst the means is significant (Table 50(c)). Table 50(d) shows this to be so in the case of girls only.

## Diet sub-scale: Sweet Foods

**Table 51: Regression analysis: Diet - sweet foods sub-scale**  
 sum DWI(dependent variable) with sum DWB and sum DWSP

(a) All cases and by gender	All cases	All Girls	All boys
No. of cases	347	192	155
DWI with DWB $r=$	0.34	0.28	0.35
DWI with DWSP $r=$	0.35	0.27	0.38
DWB with DWSP $r=$	0.28	0.26	0.25
Multiple $R=$	0.43	0.35	0.46
Multiple $R^2=$	0.18	0.12	0.21
F	38.99	13.31	20.04
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DWB	0.26	0.23	0.27
F	27.03	10.65	12.96
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DWSP	0.27	0.21	0.31
F	29.21	9.13	17.09
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$

(b) By year group	All Cases		
	Lower	Middle	Upper
No. of cases	110	108	129
DWI with DWB $r=$	0.41	0.28	0.35
DWI with DWSP $r=$	0.36	0.41	0.34
DWB with DWSP $r=$	0.27	0.29	0.31
Multiple $R=$	0.49	0.43	0.43
Multiple $R^2=$	0.24	0.19	0.18
F	17.06	12.60	13.90
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$
Beta DWB	0.34	0.18	0.27
F	14.95	3.80	9.93
Significance of F	$p<0.01$	ns	$p<0.01$
Beta DWSP	0.28	0.35	0.26
F	10.09	14.84	9.23
Significance of F	$p<0.01$	$p<0.01$	$p<0.01$

(c) By gender and year group	Girls			Boys		
	Lower	Middle	Upper	Lower	Middle	Upper
No. of cases	63	54	75	47	54	54
DWI with DWB $r=$	0.39	0.16	0.29	0.43	0.32	0.35
DWI with DWSP $r=$	0.26	0.38	0.26	0.47	0.37	0.39
DWB with DWSP $r=$	0.33	0.19	0.21	0.19	0.30	0.36
Multiple $R=$	0.41	0.39	0.35	0.59	0.43	0.44
Multiple $R^2=$	0.17	0.15	0.13	0.34	0.19	0.20
F	6.16	4.62	5.23	11.53	5.82	6.34
Significance of F	$p<0.01$	$p<0.05$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$
Beta DWB	0.34	0.09	0.25	0.35	0.23	0.24
F	7.47	0.44	4.82	8.03	3.01	3.10
Significance of F	$p<0.01$	ns	$p<0.05$	$p<0.01$	ns	ns
Beta DWSP	0.15	0.37	0.21	0.41	0.30	0.30
F	1.40	7.79	3.43	10.74	5.19	5.05
Significance of F	ns	$p<0.01$	ns	$p<0.01$	$p<0.05$	$p<0.05$

**Table 52: Means, Standard Deviations, Analysis of Variance:  
Diet - Sweet foods Intentions**

(sum DWI range 0 to +6)

**(a) All cases**

	All cases	
	n=364	
<hr/>		
	M   3.27	
	SD   1.75	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=195		n=169	
<hr/>					
	M	2.29		3.67	
	SD	1.75		1.66	
<hr/>					

F=17.17 df 1,362 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=116		n=116	
		<hr/>			
	M	3.11		3.53	
	SD	1.75		1.75	
				1.74	
<hr/>					

F = 1.89 df 2,361 p<0.15

**(d) By gender and by year groups**

Girls				Boys			
	Lower	Middle	Upper		Lower	Middle	Upper
	n=64	n=56	n=75		n=52	n=60	n=57
M	2.89	3.04	2.87		3.38	3.98	3.60
SD	1.78	1.76	1.74		1.69	1.62	1.66

F=0.16 df 2,192 p<0.85

F=1.90 df 2,166 p<0.15

**(e) Year groups taken separately, by gender**

Lower School: F=2.30 df 1,114 p<0.13

Middle School: F=9.13 df 1,114 p<0.01

Upper School: F=5.93 df 1,130 p<0.02

**Table 53: Means, Standard Deviations, Analysis of Variance:  
Diet - Sweet foods Beliefs**

(sum DWB range -18 to +18)

**(a) All cases**

	All cases	
	n=361	
<hr/>		
	M   -2.87	
	SD   4.06	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=195		n=166	
<hr/>					
	M	-3.54		-2.07	
	SD	3.77		4.25	
<hr/>					

F=12.15 df 1,359 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=114	n=115	n=132	
<hr/>					
	M	-2.82	-3.47	-2.38	
	SD	4.38	3.77	3.98	
<hr/>					

F = 2.24 df 2,358 p<0.11

**(d) By gender and by year groups**

		Girls					Boys			
		<hr/>					<hr/>			
		Lower	Middle	Upper			Lower	Middle	Upper	
		n=64	n=56	n=75			n=50	n=59	n=57	
<hr/>										
	M	-3.53	-4.23	-3.04			-1.92	-2.75	-1.51	
	SD	4.01	3.62	3.63			4.70	3.79	4.27	
<hr/>										

F=1.62 df 2,192 p<0.20

F=1.28 df 2,163 p<0.28

**(e) Year groups taken separately, by gender**

Lower School: F=3.90 df 1,112 p<0.05

Middle School: F=4.62 df 1,113 p<0.03

Upper School: F=4.94 df 1,130 p<0.03

**Table 54: Means, Standard Deviations, Analysis of Variance:  
Diet - Sweet foods Social Pressures**

Social Pressures (sum DWSP: range 0 to +18)

**(a) All cases**

	All cases	
	n=355	
<hr/>		
M	2.92	
SD	3.30	
<hr/>		

**(b) By gender**

	Girls	Boys
	n=194	n=161
<hr/>		
M	2.30	3.66
SD	2.51	3.93
<hr/>		

F=15.59 df 1,353 p<0.01

**(c) By year groups**

	All cases	
	<hr/>	
	Lower   Middle   Upper	
	n=115   n=111   n=129	
<hr/>		
M	3.68	2.52   2.57
SD	4.12	3.14   2.39
<hr/>		

F = 4.65 df 2,352 p<0.01

**(d) By gender and by year groups**

	Girls	Boys
	<hr/>	<hr/>
	Lower   Middle   Upper	Lower   Middle   Upper
	n=65   n=54   n=75	n=50   n=57   n=54
<hr/>		
M	2.95	1.61   2.23
SD	3.13	1.76   2.23
<hr/>		

F=4.43 df 2,191 p<0.01

F=2.31 df 2,158 p<0.10

**(e) Year groups taken separately, by gender**

Lower School: F=4.78 df 1,113 p<0.03

Middle School: F=9.56 df 1,109 p<0.01

Upper School: F=3.85 df 1,127 p<0.05

## **Preliminary comments on Diet: Sweet foods sub-scale**

### ***Regression analyses***

Tables 51(a), (b), (c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning eating sweet foods, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (parental pressure in this case) they experience. The F ratios for multiple regression are all statistically significant beyond the 1% level, with the exception of that for Middle School girls, which is significant between the 1% and the 5% levels. Thus the Ajzen and Fishbein model appears internally valid when applied to the Diet - Sweet foods sub-scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to eat sweet foods. The influences of Beliefs and Social Pressures on Intentions are generally very similar.

### ***Intentions***

Table 52(a) shows that overall, the mean Intentions to eat sugar and sweet foods is fairly strong. Table 52(b) shows that the mean Intentions of boys to eat sweet foods is stronger than that of girls and the difference between the means is significant. Further analysis shows the latter to be the case in the Middle and Upper Schools only (Tables 52(d), (e)).

The mean Intentions to eat sweet foods are similar for the different age groups and there is no significant difference amongst the means (Table 52(c)).

### ***Beliefs***

Table 53(a) shows that overall, mean Beliefs about eating sugar and sweet foods are negative. The mean Beliefs of girls is more negative than that of boys and the difference between the means is significant (Table 53(b)). Tables 53(d), (e), however, indicate that the latter is true for girls and boys in the Middle and Upper School only.

The mean Beliefs about eating sweet foods are similar for the different age groups and there is no significant difference amongst the means (Table 53(c)).

### ***Social pressures***

Table 54(a) shows that the mean Parental Approval with respect to eating sweet foods, reported by young people, is slight. Table 54(b) shows that the mean Parental Approval reported by boys is greater than that reported by girls and the difference between the means is significant. Tables 54(d), (e) however indicate that the latter is true for boys and girls in the Middle and Upper Schools only.

The mean Parental Approval reported by Lower School pupils is stronger than that reported by pupils in the Middle and Upper Schools and the differences amongst the means is significant (Table 54(c)). Table 54(d) however indicates that the latter is true in the case of girls only.

## Diet sub-scale: Fatty Foods

**Table 55: Regression analysis: Diet - Fats sub-scale**  
 sum DAI(dependent variable) with sum DAB and DASP

(a) All cases and by gender		All cases	All Girls	All boys
No. of cases		346	191	155
DAI with DAB $r=$		0.45	0.45	0.36
DAI with DASP $r=$		0.26	0.25	0.22
DAB with DASP $r=$		0.22	0.20	0.18
Multiple $R=$		0.48	0.48	0.40
Multiple $R^2=$		0.23	0.23	0.16
F		50.66	28.10	14.06
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DAB		0.41	0.42	0.33
F		70.10	40.60	19.34
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DASP		0.17	0.17	0.16
F		12.22	6.73	4.55
Significance of F		$p<0.01$	$p<0.05$	$p<0.05$

(b) By year group		All Cases		
		Lower	Middle	Upper
No. of cases		111	108	127
DAI with DAB $r=$		0.53	0.47	0.38
DAI with DASP $r=$		0.31	0.29	0.19
DAB with DASP $r=$		0.23	0.35	0.10
Multiple $R=$		0.56	0.49	0.41
Multiple $R^2=$		0.32	0.24	0.17
F		24.97	16.27	12.38
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DAB		0.48	0.42	0.36
F		34.35	20.95	19.36
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$
Beta DASP		0.21	0.14	0.16
F		6.31	2.53	3.57
Significance of F		$p<0.05$	ns	ns

(c) By gender and year group		Girls			Boys		
		Lower	Middle	Upper	Lower	Middle	Upper
No. of cases		63	53	75	48	55	52
DAI with DAB $r=$		0.52	0.40	0.47	0.52	0.43	0.18
DAI with DASP $r=$		0.25	0.30	0.21	0.36	0.19	0.12
DAB with DASP $r=$		0.35	0.33	-0.02	0.53	0.30	0.21
Multiple $R=$		0.52	0.44	0.52	0.62	0.43	0.20
Multiple $R^2=$		0.27	0.19	0.27	0.38	0.18	0.04
F		11.09	5.88	13.46	13.94	5.88	1.00
Significance of F		$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p<0.01$	$p>0.05$
Beta DAB		0.49	0.33	0.48	0.51	0.41	0.16
F		17.26	6.10	22.39	18.60	9.57	1.25
Significance of F		$p<0.01$	$p<0.05$	$p<0.01$	$p<0.01$	$p<0.01$	ns
Beta		0.07	0.19	0.22	0.33	0.06	0.09
F		0.38	2.06	4.91	7.91	0.22	0.37
Significance of F		ns	ns	$p<0.05$	$p<0.01$	ns	ns



**Table 56: Means, Standard Deviations, Analysis of Variance:  
Diet - Fats Intentions**

(sum DAI range 0 to +9)

**(a) All cases**

	All cases	
	n=366	
<hr/>		
	M   6.02	
	SD   1.92	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=196		n=170	
<hr/>					
	M	5.59		6.49	
	SD	1.89		1.85	
<hr/>					

F=21.01 df 1,364 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower	Middle	Upper	
		n=118	n=117	n=131	
<hr/>					
	M	6.02	6.23	5.81	
	SD	1.94	1.87	1.93	
<hr/>					

F = 1.50 df 2,363 p<0.22

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower	Middle	Upper				Lower	Middle	Upper	
		n=65	n=56	n=75				n=53	n=61	n=56	
<hr/>											
	M	5.74	5.52	5.53				6.38	6.89	6.18	
	SD	1.91	1.89	1.88				1.94	1.62	1.96	
<hr/>											

F=0.28 df 2,193 p<0.76

F=2.31 df 2,167 p<0.10

**(e) Year groups taken separately, by gender**

Lower School: F= 3.22 df 1,116 p<0.08

Middle School: F=17.83 df 1,115 p<0.01

Upper School: F= 3.66 df 1,129 p<0.06

**Table 57: Means, Standard Deviations, Analysis of Variance:  
Diet - Fats Beliefs**

(sum DAB range -36 to +36)

**(a) All cases**

	All cases	
	n=355	
<hr/>		
	M   6.80	
	SD   6.94	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=192		n=163	
<hr/>					
	M	5.10		8.81	
	SD	6.49		6.94	
<hr/>					

F=27.07 df 1,353 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=114		n=111	
		n=130			
<hr/>					
	M	6.46		6.37	
	SD	7.56		7.14	
				6.15	
<hr/>					

F = 0.97 df 2,352 p<0.38

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower		Middle		Upper		Lower		Middle	
		n=63		n=54		n=75		n=51		n=57	
		n=55						n=55			
<hr/>											
	M	4.10		4.30		6.52		9.37		8.33	
	SD	6.65		6.89		5.85		7.66		6.89	
								6.36			
<hr/>											

F=3.03 df 2,189 p<0.05

F=0.30 df 2,160 p<0.74

**(e) Year groups taken separately, by gender**

Lower School: F=15.49 df 1,112 p<0.01

Middle School: F= 9.94 df 1,109 p<0.01

Upper School: F= 4.41 df 1,128 p<0.04

**Table 58: Means, Standard Deviations, Analysis of Variance:  
Diet - Fats Social Pressures**

Social Pressures (sum DASP: range 0 to +27)

**(a) All cases**

	All cases	
	n=359	
<hr/>		
	M   7.30	
	SD   4.64	
<hr/>		

**(b) By gender**

		Girls		Boys	
		n=195		n=164	
<hr/>					
	M	6.60		8.13	
	SD	3.86		5.31	
<hr/>					

F=9.92 df 1,357 p<0.01

**(c) By year groups**

		All cases			
		<hr/>			
		Lower		Middle	
		n=115		n=114	
		n=130			
<hr/>					
	M	8.29		6.78	
	SD	5.39		4.56	
				3.80	
<hr/>					

F = 3.92 df 2,356 p<0.02

**(d) By gender and by year groups**

		Girls						Boys			
		<hr/>						<hr/>			
		Lower		Middle		Upper		Lower		Middle	
		n=65		n=55		n=75		n=50		n=59	
		n=55						n=55			
<hr/>											
	M	7.43		5.62		6.60		9.40		7.86	
	SD	4.21		3.30		3.81		6.49		5.29	
								3.80			
<hr/>											

F=3.36 df 2,192 p<0.04

F=2.29 df 2,161 p<0.10

**(e) Year groups taken separately, by gender**

Lower School: F=3.87 df 1,113 p<0.06

Middle School: F=7.28 df 1,112 p<0.01

Upper School: F=0.94 df 1,128 p<0.33

## Preliminary comments on Diet: Fatty foods sub-scale

### **Regression analyses**

Tables 55(a),(b),(c) show that a statistically significant amount of the variance in the Intentions of adolescents, concerning eating fatty foods, is explained by a weighted combination of the variance in their Beliefs and the Social Pressures (parental pressure in this case) they experience. The F ratios for multiple regression are all statistically significant beyond the 1% level, with the exception of that for Upper School boys, which is not significant at the 5% level. In general the Ajzen and Fishbein model is internally valid when applied to the Diet - Fats sub-scale.

Overall, the beta weights associated with the two independent variables, Beliefs and Social Pressures, show that both contribute significantly to the prediction of Intentions to eat fatty foods. The influence of Beliefs is stronger than that of Social Pressures, except in the case of Upper School boys, for whom neither has significant influence.

### **Intentions**

Tables 56(a) shows that the mean Intentions of young people to eat fatty foods is quite strong. Table 56(b) shows that boys' mean Intentions are stronger than those of girls and the difference between the means is significant. Tables 56(d),(e) however indicate that the latter is true for the boys and girls in the Middle School only.

The mean Intentions to eat fatty foods are similar for the different age groups and there is no significant difference amongst the means (Table 56(c),(d)).

### **Beliefs**

Table 57(a) shows that mean Beliefs about eating fatty foods are positive. Boys' Beliefs are more positive than those of girls at all age levels and the differences between the means are significant (Tables 57(b),(d),(e)).

The mean Beliefs about eating fatty foods are similar for all age groups and there is no significant difference amongst the means (Tables 57(c),(d)).

### **Social pressures**

Table 58(a) shows that the mean Parental Approval with respect to eating fatty foods, reported by young people, is quite strong. The mean Parental Approval reported by boys is stronger than that reported by girls (Table 58(b)). Table 58(d),(e) however indicates that the latter is true only in the case of the Middle School.

The mean Parental Approval for eating fatty foods is stronger in the Lower School than in the Middle and Upper Schools and the difference amongst the means is significant (Table 58(c)).

Table 59: Matrix of Scale Intercorrelations (N= 340 to 368)

	A I	A B	A SP	S I	S B	S SP	K I	K B	K SP	DP I	DP B	DP SP	DF I	DF B	DF SP	DS I	DS B	DS SP	DG I	DG B	DG SP	DW I	DW B	DW SP	DA I	DA B	DA SP
AI		53	47	40	32	47	07	-01	-03	22	18	-17	10	06	-13	10	00	-24	05	-02	-18	09	35	12	20	27	07
AB	53		41	35	44	43	-15	-13	-12	08	-07	-04	-11	-15	-08	09	19	-18	-15	-15	-07	04	45	15	20	35	03
ASP	47	41		10	13	43	10	18	13	18	25	24	-16	14	08	-05	-01	-15	-18	19	19	09	33	21	15	32	19
SI	40	35	10		43	61	-13	-09	-18	-02	-18	-12	01	-14	-09	07	01	-02	-16	-02	-14	01	-01	-04	-05	-08	-11
SB	32	44	13	43		39	-14	-22	-12	-24	-29	-22	01	-03	-11	-04	-13	03	-20	-24	-23	11	36	06	05	07	-02
SSP	47	43	43	61	38		-08	-08	15	00	-12	-07	02	-10	-11	07	-01	09	-06	00	-07	00	05	05	00	-02	-04
KI	05	-15	10	-13	-14	-08		51	36	23	25	15	30	32	36	-11	-07	-14	24	27	26	-17	-34	-06	-09	-05	06
KB	-01	-13	18	-09	-22	-08	51		37	05	34	18	24	30	27	-09	00	-02	29	41	31	-26	-25	-13	-17	-03	-02
KSP	-03	-12	13	-18	-12	15	36	37		02	22	35	21	21	40	-11	-11	-08	20	33	52	-03	-21	09	00	04	25
DPI	22	08	18	-02	-24	00	23	05	02		34	21	28	22	23	09	00	00	28	28	15	03	04	02	09	07	06
DPB	18	-07	25	-18	-29	-12	25	34	22	34		37	24	39	31	08	-06	05	29	48	29	06	-04	06	07	21	24
DPSP	-17	-04	24	-12	-22	-07	15	18	35	21	37		16	25	72	05	-09	35	21	29	85	00	-07	34	-03	04	61
DFI	11	-12	-16	00	01	02	30	24	21	28	24	16		51	49	01	-08	13	37	23	24	-11	-09	00	-14	-04	08
DFB	06	-15	14	-14	-03	-10	32	30	21	22	39	25	51		45	04	-07	08	18	27	24	-12	-09	-02	-09	07	08
DFSP	-13	-08	08	-09	-11	-11	36	27	40	23	31	72	49	45		03	-14	30	27	27	74	-05	-07	22	-06	-03	44
DSI	10	09	-05	07	-04	07	-11	-09	-11	09	08	05	01	04	03		47	34	-05	-13	02	17	14	07	14	13	06
DSBB	00	19	-01	01	-13	00	-07	00	-11	00	-06	-09	-08	-07	-14	47		21	-14	-16	-12	11	15	06	09	15	03
DSSP	-24	-18	-15	-02	03	09	-14	-02	-08	00	05	35	13	08	30	34	21		07	06	27	10	04	42	06	04	39
DBI	05	-15	-19	-16	-20	-06	24	29	20	28	29	21	37	18	27	05	-14	07		51	36	-14	-16	00	-13	-11	05
DGB	-02	-15	19	-02	-24	00	27	41	33	28	48	29	23	27	27	-13	-16	-06	51		35	-09	-28	-10	-16	-04	05
DGSP	-18	-07	19	-14	-22	-07	26	31	52	15	29	85	23	24	74	02	-12	27	36	35		-08	-13	28	-06	-02	58
DWI	09	04	09	01	11	00	-17	-26	-03	03	06	01	-11	-12	-05	17	11	10	-14	-09	-08		34	36	55	32	18
DWBB	35	45	33	-01	36	05	-34	-25	-21	04	-04	-07	-09	-09	-07	14	15	04	-16	-28	-13	34		26	26	43	11
DWSP	12	15	21	-04	06	05	-06	-13	09	01	06	34	00	-02	22	06	06	42	-01	-10	28	36	26		29	22	74
DAI	20	20	15	-05	05	00	-09	-17	00	09	07	-03	-14	-09	-06	14	09	06	-13	-16	-06	55	26	29		45	26
DAB	27	35	32	-08	07	-02	-05	03	04	07	21	04	-04	07	-03	13	15	04	-11	-04	-02	32	43	22	45		23
DASP	07	03	19	-11	-02	-04	-06	-02	25	06	24	61	07	08	44	06	-03	39	05	05	58	18	11	74	26	23	

Correlations of more than 0.11 are statistically significant beyond the 5% level and 0.14, the 1% level.

**Table 60: Summary table of factor analysis of computed variables: eight factor solution**

(SumAI to SumDASP)

Factor	% Variance	Factor definition
1	19.2	Social Pressure concerning Diet and Keeping fit
2	14.0	Sweet and Fatty foods
3	10.1	Drinking Alcohol and Smoking
4	7.3	Indulgencies
5	6.2	Salt
6	5.0	Fibre
7	4.5	Healthy diet and fitness
8	4.1	Fitness
Total	70.4	

**Table 61: Factor 1 - Social pressure concerning diet and fitness (19.2% of the variance)**

Item	Loading
Diet: Protein Social Pressure	0.89
Diet: Greens etc. Social Pressure	0.86
Diet: Fatty foods Social Pressure	0.76
Diet: Fibre Social Pressure	0.71
Diet: Sweet foods Social Pressure	0.55
Diet: Salt Social Pressure	0.49
Keeping fit Social Pressure	0.34

**Table 62: Factor 2 - Sweet and Fatty foods (14% of the variance)**

Item	Loading
Diet: Fat Intentions	0.70
Diet: Sweet Intentions	0.66
Diet: Sweet Social Pressures	0.58
Diet: Fat Beliefs	0.53
Diet: Fat Social Pressures	0.48
Diet: Sweet Beliefs	0.44

**Table 63: Factor 3 - Drinking Alcohol and Smoking Cigarettes (10.1% of the variance)**

Item	Loading
Smoking Social Pressure	0.90
Smoking Intentions	0.71
Alcohol Intentions	0.55
Smoking Beliefs	0.53
Alcohol Beliefs	0.49
Alcohol Social Pressure	0.31

**Table 64: Factor 4 - Indulgencies**  
(7.3% of the variance)

Item	Loading
Alcohol Social Pressure	0.69
Alcohol Beliefs	0.69
Diet: Sweet Beliefs	0.62
Alcohol Intentions	0.60
Diet: Fat Beliefs	0.51
Smoking Beliefs	0.31

**Table 65: Factor 5 - Salt**  
(6.2% of the variance)

Item	Loading
Diet: Salt Beliefs	0.71
Diet: Salt Intentions	0.68
Diet: Salt Social Pressure	0.44

**Table 66: Factor 6 - Fibre**  
(5% of the variance)

Item	Loading
Diet: Fibre Intentions	0.80
Diet: Fibre Beliefs	0.52
Diet: Fibre Social Pressure	0.51

**Table 67: Factor 7 - Diet and fitness**  
(4.5% of the variance)

Item	Loading
Diet: Greens Beliefs	0.67
Diet: Protein Beliefs	0.67
Diet: Protein Intentions	0.56
Diet: Greens Intentions	0.53
Diet: Fibre Intentions	0.38
Diet: Fibre Beliefs	0.37
Diet: Protein Social Pressure	0.36
Keeping fit Beliefs	0.36
Diet: Greens Social Pressure	0.35
Diet: Fibre Social Pressure	0.33
Keeping fit Intentions	0.32

**Table 68: Factor 8 - Fitness**

(4.1% of the variance)

Item	Loading
Keeping fit Beliefs	0.71
Keeping fit Intentions	0.64
Keeping fit Social Pressure	0.61
Diet: Greens Belief	0.48
Diet: Greens Social Pressure	0.44
Diet: Sweet Beliefs	-0.39
Diet: Fibre Social Pressure	0.39
Diet: Protein Beliefs	0.39
Diet: Fibre Beliefs	0.38

**Table 69: Factor inter-correlations**

Factor	1	2	3	4	5	6	7	8
Factor 1		15	-05	-06	03	-15	17	20
Factor 2	15		03	29	18	02	-07	-19
Factor 3	-05	03		23	-03	-04	-11	-12
Factor 4	-06	29	23		04	00	03	-01
Factor 5	03	18	-03	04		-02	-03	-17
Factor 6	-15	02	-04	00	-02		-22	-10
Factor 7	17	-07	-11	03	-03	-22		39
Factor 8	20	-19	-12	-01	-17	-10	39	



**Preliminary comments on scale intercorrelations**

Correlations between Intentions and their respective Beliefs and Social Pressures are all significant beyond the 1% level.

Correlations between Intentions for each topic and their respective Beliefs and Social Pressures are generally higher than those with any other variable (Diet being considered as a single topic).

For the scales in general, however, notable correlations occur between:

- (i) Alcohol and Smoking;
- (ii) Keeping Fit and Diet;
- (iii) Amongst the Diet Sub-scales.

The factors emerging from factor analysis of these data appear to be concerned either with:

- (i) perceptions of physical fitness (diet and exercise);
- or
- (ii) perceptions of potential health hazards (alcohol, smoking, and eating certain types of food).

## DISCUSSION OF RESULTS

The results for each topic will now be discussed in the sequence in which the hypotheses are set out on page 1.17.

**Hypothesis 1**

This hypothesis states:

that a statistically significant amount of the variance in intentions of adolescents, concerning aspects of health behaviour, is explained by a weighted combination of the variance in their beliefs and the social pressures they experience concerning such behaviour.

For 'all cases', Hypothesis 1 is accepted (Tables 23(a), 27(a), 31(a), 35(a), 39(a), 43(a), 47(a), 51(a), 55(a)). The amount of the variance in Intentions explained ranges from 42% on the Smoking scale, to 10% on the sub-scale Diet: Protein. These values are similar in magnitude to those frequently reported in social and educational research using correlation techniques with adolescents. For example, in the area of language, the Assessment of Performance Unit (APU 1983) reported correlations between attitude scales and reading performance scores as follows:

Attitude Scale	correlation	p
Pleasure in independent, extended reading	0.33	0.001
Reluctance towards extended reading	-0.45	0.001
Reading for self-improvement	-0.15	0.001
Preference for factual reading	-0.06	0.05
Attitudes towards reading aloud	0.01	0.87
Attitudes towards school activities associated with reading	-0.10	0.02

(reproduced from APU (1983) p.143)

Thus in this instance, the quoted amount of variance in the dependent variable explained by one predictor varies from 20% to a non significant 0.01%.

In the area of the maths and science, correlations between 'O' level examination grades and a combination of two predictors: Scholastic Aptitude (CP100) and Factor 1 from the Science Attitude Questionnaire Alternative Form (CP104), range from  $R=0.62$  for 'O' level Maths to  $R=0.48$  for 'O' level Chemistry. Thus, 42% to 23% of the variance in these 'O' level results is explained by a combination of the two predictors (Nuttall 1971).

However, the amount of the variance in adolescents' Intentions explained by a combination of the variance in measures of Beliefs and Social Pressures is lower than that reported by researchers using the model with adults (see page 2.14). It is also lower than that in the trial run (see page 5.13).

There are several factors which might explain the lower values of  $R^2$  in the main survey: the suitability of the Ajzen and Fishbein Model for use with adolescents; the incorporation of random error in the data (see pages 6.1 and 6.2); the intrinsic reliability of the scales, i.e. the presence of constant error in the questionnaires (see pages 6.1 and 6.2); and the use of very short scales in the Diet questionnaires.

***The suitability of the model for use with adolescents***

Only one example could be found in the literature of the use of the Ajzen and Fishbein model in investigations involving adolescents (page 2.18). For the most part, the model has been used with adults and furthermore with adults of a particular type, that is articulate and intelligent and with well developed life-styles. Ajzen and Fishbein suggest that their model is inclusive, subsuming demographic variables, attitudes towards targets, and personality traits (see page 1.19). This may well be so for the adults with whom the model has generally been used. For adolescents, however, the model may not be so all-embracing. Demographic factors such as socio-economic status, occupation, religion by which adolescents might be characterised, are those of their parents. Their attitudes and personality traits are still in a state of flux: they are receiving many messages from external sources and have not yet fully internalised them. This lack of maturity would threaten the inclusiveness of the model when used with adolescents.

A factor which Ajzen and Fishbein have not included in their model is that of opportunity. The external validity study (pages 6.12 to 6.20) indicated that there was a satisfactory correlation between Intentions and Behaviour, particularly when the 'random uncertainties' revealed by the pupil interviews were taken into account. It is clear from these interviews that pupils are not free to behave as they wish:

"...there was supposed to be a party but it never happened."

"...there was no family celebration during this time."

"...it depends on what goes on at home."

"...I didn't go to any discos or parties because I split up with my boy-friend."

(Appendix 10)

So despite their firmness, the Intention scores may not be a true reflection of how adolescents would *like* to behave, but will include perceptions of *opportunities* to behave in a particular way, e.g. pupils will say that they *intend* to eat what they know will be provided by parents, at school meals, in the school tuck shop, etc.; they will say they intend to drink alcoholic drinks at home if they know that parents are likely to offer them; they will say they intend to take part in sporting activities when they know that parents will provide the necessary money for club membership and equipment. (This 'opportunity' element may equate with the element of 'past behaviour' which some workers have incorporated into the model, see page 3.8). Intentions, incorporating perceptions of opportunity, are unlikely to correlate strongly with personal Beliefs and personal perceptions of Social Pressure. This could be another reason why the model is apparently not such a good fit for adolescents as compared with adults, who might have rather more control over their lives.

### **Random error**

It will be recalled that the trial run was carried out under carefully supervised conditions (see page 5.11). Precautions were taken in the administration of the main survey which were intended to ensure that questionnaires were completed in formal and controlled settings, but as noted (page 7.5), there were shortcomings. In principle, the administrative conditions for all pupils were as similar

as possible. But in practice settings were sometimes less formal than the science laboratories used in the trial run, e.g. libraries and lecture theatres where children were forced to sit close together. Also pupils were taken from classes, such as Social Education, in which they would normally have expected to enjoy an informal and relaxed atmosphere. This may have resulted in a less serious attitude towards the questionnaires than would have been desirable. Furthermore pupils of mixed ability took part: it is possible that the less able pupils were not able to read and understand the questionnaires adequately and thus did not answer them meaningfully. Although they were advised to ask for help if they did not understand, in the event very few did ask. The sample would have been biased if the poor readers had been omitted, but it is accepted that some of them may have merely circled words at random thus increasing the amount of 'variable or random error' included in the data.

### ***The intrinsic reliability of the scales***

The presence of 'constant error' will reduce the intrinsic reliability of a measure, since the observed score will be contaminated with irrelevant factors (see pages 6.1 and 6.2). Possible sources of constant error in these present questionnaires are: response bias and response sets. Response bias may have occurred because pupils did not wish to admit to smoking or having any positive beliefs about it, since smoking is seen as socially undesirable in school, whereas on the other hand they may have boastfully exaggerated about the amount of alcohol they drink because drinking is seen to be glamorous.

**Short scales**

The values for  $R^2$  are on the whole lower in respect of the Diet sub-scales than in the Alcohol, Smoking, and Keeping Fit scales. This is probably because, in attempting to keep the questionnaires to a size acceptable to the pupils, the Diet sub-scales were short and in some cases were made up of single items only (see pages 8.3 and 8.4). This would tend to further reduce the reliability of these Diet scales (see page 2.8).

**Hypothesis 2**

This hypothesis states:

that overall, both beliefs and social pressures will have a statistically significant influence on intentions;

This hypothesis is accepted for all the topics. In the analysis of 'all cases', in respect of each scale, the beta weights associated with the two independent variables, Beliefs and Social Pressures, indicate that both have a statistically significant influence on adolescents' Intentions (Tables 23a, 27a, 31a, 35a, 39a, 43a, 47a, 51a).

**Alcohol**

Overall, Beliefs have a stronger influence than Social Pressures on Intentions to drink alcohol. This reflects the findings reported in 'Young people in the 80's, a survey' (page 1.2).

### ***Smoking***

Overall, Social Approval has a stronger influence on Intentions to smoke than Beliefs about smoking (Table 27(a)). Nelson et al (1985) reported a weak relationship between a young person's beliefs about the health hazards of smoking and his or her smoking status (see page 1.4). They found that, although the belief that smoking is enjoyable is the strongest predictor of 'smoker status', this is closely followed by teenagers' expectations of whether parents and friends would mind if they smoked. Furthermore, Dobbs and Marsh (1983, p.4) point out that most studies of children's smoking prevalence reveal a strong association between parents' smoking behaviour and that of their children. This indicates that parental example and tacit approval is associated with smoking in young people. The results of this study are thus similar to those of other researchers in this field.

### ***Keeping Fit***

Overall, Beliefs have a stronger influence than Social Expectations on Intentions to keep fit (Table 31 a). It seems reasonable that there would be little social pressure on young people to take physical exercise, as compared with that in respect of the other topics.

### ***Diet***

With the exception of sweet foods, overall, Beliefs have a stronger influence than Parental Pressures on Intentions to eat the foods included in this study (see Tables 35a, 39a, 43a, 47a, 55a). In the case of sweet foods (Table 51a), the influence of the independent variables is similar. It is



possible that Parental Pressures in the case of Diet are implicit and covert, that is, parents provide the food which they think their children should eat without openly pressurising them to do so. It will be recalled that the percentage of variance in Intentions explained by Beliefs and Social Pressures is relatively low, indicating that other factors may be affecting Intentions. One such factor may be the opportunity to eat certain types of foods (see the discussion above, under 'suitability of the model').

### **Hypotheses 3 and 4**

Hypotheses 3 and 4 state:

that for girls and boys taken separately, both beliefs and social pressures will have a statistically significant influence on intentions;

that for the different age groups taken separately, both beliefs and social pressures will have a statistically significant influence on intentions;

These hypotheses were rejected in a number of instances, discussed in detail below. There were many more cases of beta weights associated with Social Pressures being non significant than those associated with Beliefs.

### **Alcohol**

The beta weights associated with Beliefs about drinking alcohol are all significant. Those associated with Social Pressures are not significant for the year groups taken separately nor for the year groups subdivided by gender, apart from Upper School girls (Tables 23 a,b,c). It is interesting to note that, in the case of Upper School girls,

Social Pressures have a stronger influence than Beliefs on Intentions to drink. This is a reversal of the general trend in the data noted above under hypothesis 2 and one might speculate that it is due to the influence of the (generally) older boy-friends of these 15 to 18 year old girls.

### ***Smoking***

The beta weights associated with Social Pressures about smoking are all significant. A number of those associated with Beliefs are not: the Lower School taken separately, Lower School girls and Lower and Middle School boys. Except for the case of Upper School boys, Social Pressures have a greater influence than Beliefs on Intentions to smoke (Tables 27 a,b,c). This tendency for Social Pressures to predominate is against the general trend in the data of this present study and that reported by other workers using the Ajzen and Fishbein model.

### ***Keeping Fit***

The beta weights associated with Beliefs about keeping fit are all significant. Those associated with Social Pressures are not significant in the Upper School taken separately, Lower School girls and Lower, Middle and Upper School boys (Tables 31 a,b,c). In all cases Beliefs have a stronger influence than Social Pressures on Intentions to keep fit. Considering the popular image of boys being keen on sport, it is surprising that the beta weights associated with boys are generally weaker than those associated with girls.

***Diet: Protein***

For boys, all the beta weights are non-significant with the exception of those associated with Social Pressures in the Middle School. For girls, only those associated with Beliefs are significant: those associated with Social Pressures are not. (Tables 35 a,b,c). Thus for girls, only Beliefs influence Intentions to eat foods rich in protein: for boys, neither of the independent variables has a significant influence. This difference could be because more girls than boys are taught Home Economics and thus learn about nutrition, increasing their knowledge about the importance of protein in the diet.

***Diet: Fibre***

The beta weights associated with Social Pressures to eat fibrous foods are all significant. With the exception of both boys and girls in the Upper School, those associated with Beliefs are also significant (Tables 39 a,b,c). Apart from boys and girls in the Upper School, Beliefs have the stronger influence than Social Pressures on Intentions to eat foods rich in fibre.

***Diet: Salt***

With the exception of Upper School boys, all the beta weights associated with Beliefs about adding extra salt are significant. Those associated with Social Pressures are also significant apart from girls and boys in the Middle School (Tables 43 a,b,c). Except for boys in the Upper School, Beliefs have the stronger influence on Intentions to add extra salt to their food.

***Diet: Green vegetables, salad and fruit***

The beta weights associated with Beliefs about eating green vegetables, salads and fruit are all significant. Those associated with Social Pressures are also significant apart from Lower School boys and girls, Middle School girls and Upper School boys (Tables 47 a,b,c). The influence of Beliefs about eating these foods is greater than Social Pressures except in the case of Upper School girls, with whom this trend is reversed.

***Diet: Sweet Foods***

The beta weights associated with Beliefs about eating sweet foods are all significant, apart from those of girls and boys in the Middle School and boys in the Upper School. Those associated with Social Pressures are significant with the exception of Lower and Upper School girls (Tables 51 a,b,c). In the case of boys, Social Pressures have a greater influence than Beliefs on Intentions to eat sweet foods, but in the case of girls this trend is reversed except in the Middle School. In the case of the girls, the influence of Beliefs may be stronger because of the beginnings of weight consciousness in adolescence.

***Diet: Fatty Foods***

The beta weights associated with Beliefs about eating fatty foods are all significant apart from that for the Upper School boys. Those associated with Social Pressures tend not to be significant for the older pupils (Tables 55 a,b,c). Beliefs thus have a stronger influence than Social Pressures on Intentions to eat fatty foods.

## Hypothesis 5

Hypothesis 5 states:

that there are no statistically significant differences between the mean beliefs, social pressures and intentions which are attributable to age or gender.

Each topic will be considered separately with respect to this hypothesis (see tables headed Means, Standard Deviations, Analysis of Variance). It is recognised that the data on pupils' Intentions refers to the *likelihood* of the particular intended behaviour and *not* the quantity e.g. *whether* they intend to drink alcoholic drinks in the various settings, not how *much* on any particular occasion. Overall, of course, there is likely link between frequency of drinking and the total quantity consumed.

### **Alcohol** (Tables 24, 25, 26)

Mean Beliefs about drinking alcohol are negative. This endorses the findings of the investigation into adolescent drinking reported in Young People in the 80's (DES 1983), see page 1.1. Mean Beliefs become less negative as pupils get older: this tendency is accompanied by an increase in mean Social Approval of drinking and an increase in mean Intentions to drink. This agrees with Balding (1985a) (pages 1.2 to 1.3) and DES (1983 *op cit*) who report that the frequency and quantity of alcohol consumed by young people increases with age.

In the Lower School, boys report less negative mean Beliefs about drinking alcohol than girls, stronger mean Social Approval and stronger mean Intentions to drink and the differences between the means are significant. Balding

(1985a) reports that at the age of eleven, over half the boys, but only one third of the girls had drunk alcohol in the previous week. He also reports on an increase in alcohol consumption outside the home as pupils get older. This may account for the sharp rise in girls' mean Intentions to drink from Lower School to Middle School. Middle School girls (i.e. aged 13 to 15 years) tend to associate with older boys and accompany them to discos, parties and bars, hence their alcohol consumption increases. There is no significant difference between the reported mean Intentions of boys and girls in the Upper School to drink. This bears out Balding's findings that as they get older, the drinking behaviour of boys and girls becomes similar.

### **Smoking** (Tables 28, 29, 30)

Mean Beliefs about smoking are negative and there are no significant differences amongst the means of groups of differing ages. Mean Social Approval (from parents and friends) with respect to smoking cigarettes is reported to increase with age in both boys and girls and the differences amongst the means are significant. This tendency is accompanied by an increase in mean Intentions to smoke. Dobbs and Marsh (1982) and Nelson et al (1985), also reported a sharp escalation in smoking from the age of eleven to sixteen years (pages 1.3 and 1.4). In the Upper School, girls reported a stronger mean Intention to smoke than boys and the difference between the means is significant. This reflects the trend amongst adults: Tirbutt (1983), reporting on the ASH conference in November of that year, which was part of a campaign to make women

more aware of the dangers of smoking, states: '... women are the targets because they are responding less quickly to medical and social pressure to give up ...'. She points out that this is borne out by Department of Health figures: 38% of men and 33% of women smoked in 1982. In 1972, the figures were 52% of men and 41% of women. Data from this survey is generally in agreement with this trend in female behaviour.

### ***Keeping Fit*** (Tables 32, 33, 34)

Mean Beliefs about keeping fit are positive and there is no significant difference by gender or by age amongst the means. Pupils report only moderate mean social pressure to keep fit. This decreases with age and the difference amongst the means is significant. Overall, mean Intentions do not vary with age, but in the Middle School boys express a stronger mean Intention to keep fit than girls and the difference between the means is significant. The author interviewed a number of these boys to investigate the reasons for this. It was found that boys of this age tend to use their bicycles more than girls, particularly in the evenings after dark. Also a substantial number of 13 to 15 year old boys participate in organised sporting activities out of school, e.g. local junior league football. Such activities often involve the family in coaching and transporting players to fixtures away from home. These findings agree with as yet unpublished findings from the Balding Questionnaires (see page 1.9): these were obtained by personal contact (Balding 1985c). A sample of approximately 8,000 pupils (equal numbers of boys and girls) from the 3rd. and 4th. Years of secondary schools

throughout the UK, were asked to report on their sporting activity out of school. Boys claim to participate in more sporting activity outside school than girls, in fact almost half as much again. A strong male bias to sporting activity is also reported in Young People in the 80's (DES 1983). Also reported in Young People in the 80's and by Inglis et al (1984) is a fall-off in physical activity of young people after they leave school (see pages 1.5 and 1.6). As this present survey was carried out on young people still at school, the fall-off was not evident, even though some of them were over the age of sixteen.

***Diet: Protein*** (Tables 36, 37, 38)

For 'all girls', mean Beliefs about eating protein become more positive with age and the differences amongst the means are significant. This could be because girls are more knowledgeable about the importance of protein in the diet (see page 10.9). Pupils report moderate mean Parental Pressure to eat protein but this does not vary significantly with age or gender. Mean Intentions to eat protein increase with age and the differences amongst the means are significant, which is hardly surprising, since between the ages of 11 and 18 years pupils grow very rapidly. This increase is also found in unpublished data from the Balding Questionnaires: analysis of data collected from 13,000 pupils aged from 11 to 18 years, indicates that protein consumption increases substantially with age.



**Diet: Fibre** (Tables 40, 41, 42)

Overall, there are no significant differences by age or gender amongst the mean Intentions, Beliefs and Parental Pressures with respect to eating fibre. Mean Intentions to eat fibre are not at all strong: this again agrees with unpublished findings from the Balding Questionnaires (above) which indicate that over 50% of adolescents had eaten either no fibre on the previous day or only one serving. It should be noted that the NACNE Report (1983) states that the diet of most people in the UK contains too little fibre (see page 1.8).

**Diet: Salt** (Tables 44, 45, 46)

Pupils report a low mean Parental Pressure to eat extra salt. Mean Beliefs about eating salt are negative, and there are no significant differences amongst the means by age or gender, with the exception of the Upper School, where girls' mean Beliefs are more negative than those of boys and the difference between the means is significant. This is reflected to some extent in mean Intentions: in the Middle and Upper Schools boys report a stronger mean Intention to eat extra salt than girls and the differences between the means are significant. Perhaps this is because girls are often concerned about their weight and realise that extra salt in the diet can lead to an accumulation of body fluids, hence to an increase in their weight. However, it must be noted that young people say they intend to add some extra salt to their food at the table, when it is quite likely that a more than adequate amount is already incorporated (NACNE 1983, see page 1.8).

***Diet: Green vegetables, salad and fruit*** (Tables 48, 49, 50)

The mean reported value for Parental Pressure to eat these foods is quite strong. There is no significant difference in the mean reported Parental Pressure by age or by gender. Mean Beliefs are positive and tend to become more so with increasing age and the differences amongst the means are significant. Girls' mean Beliefs are more positive than those of boys' at all age levels and the differences amongst these means are significant. This is reflected in the Lower School in differences in girls' and boys' mean Intentions, those of girls being stronger than those of boys, the differences between the means being significant. Overall, mean Intentions are quite strong and are similar for the different age groups.

***Diet: Sweet Foods*** (Tables 52, 53, 54)

Overall, the mean Intention to eat sweet foods is fairly strong. Mean Beliefs about such foods are negative and are similar for the different age groups. In the Middle and Upper School, girls' mean Beliefs are more negative than those of boys, the difference between the means being significant. It may be that girls in the Middle and Upper schools are becoming weight conscious and have more negative feelings about the sugar content of their food in consequence. In the Lower and Middle School, boys report stronger mean parental approval for eating sweet foods than girls, the difference between the means being significant. This is reflected in differential mean Intentions: in the Middle and Upper School, boys' mean Intentions are stronger than those of girls, the difference between the means being significant. Those of boys and girls in the Lower School are

similar. This agrees with findings from the analysis of data from the 13,000 pupils cited above (Balding 1985c op cit), which indicate that there is little difference in the consumption of sugar by boys and girls in years 1 and 2. In years 3 to 7, girls report a lower intake of sugar than boys.

***Diet: Fatty Foods*** (Tables 56, 57, 58)

Overall, mean Beliefs about eating fatty foods are positive, those of boys being more so than those of girls, the difference between the means being significant. The mean Parental Approval for eating fatty foods reported by boys is stronger than that reported by girls and the difference between the means is again significant. This is reflected in Intentions, where there is a significant difference between the mean Intentions of boys and girls to eat fatty foods, the boys being stronger, perhaps thus differentially laying down the foundations for cardio-vascular disease, which is more prevalent in men than women. This tendency is worrying. It is in line with unpublished findings from the Balding Questionnaires which indicates that, at all age levels, boys eat more fatty foods than girls and that the fat intake of both boys and girls is high. For example, analysis of data from the 4th. Year indicates that approximately 30% of boys ate as much as eight or more fatty items on the previous day, this compares with approximately 20% of the girls. The NACNE Report (1983) recognises that the National diet contains too much animal fat and recommends that its consumption should be reduced.

### Correlation amongst the scales and topics

Table 59 shows that correlations are generally higher between Intentions for each topic and their respective Beliefs and Social Pressures, than with any other variable (considering Diet as a single topic). The single exception to this is Keeping Fit, in respect of which the correlation of Intentions with Diet: Fibre Social Pressure is equal to that with Keeping Fit Social Pressures. When the Diet sub-scales are considered, however, a number of inter-subscale correlations with each Intention are as strong as, or stronger than the within-scale correlations.

Moving away from the sole consideration of Intentions, notable correlations occur between:

- (i) the Alcohol and Smoking scales generally,  
i.e. drug related - negative;
- (ii) the Keeping fit and Diet scales generally,  
i.e. health - positive;
- (iii) the Diet sub-scales.

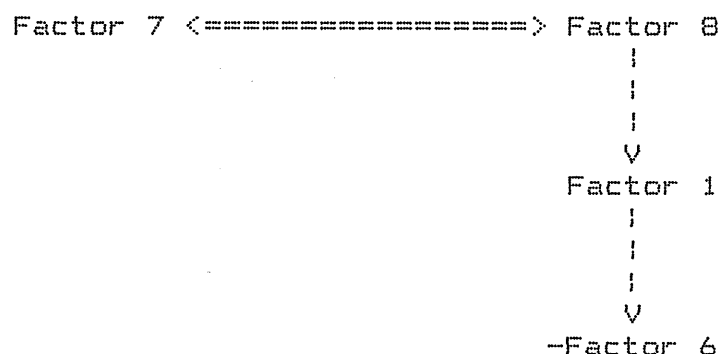
The results of a factor analysis of these inter correlations illustrates this. Just over 70% of the variance in the data was taken up by eight factors with an Eigen value of more than 1. These factors and their definition are discussed in Appendix 11.

The factors which emerge bear some resemblance to those 'embryo' factors reported in the pilot survey described in Appendix 01 (pages A01.9 to A01.14), i.e. views about:

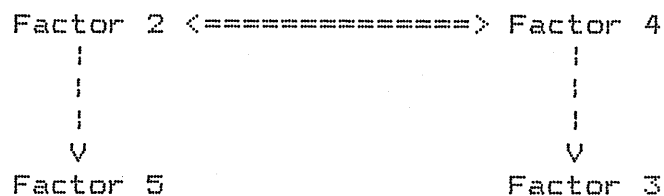
- (i) fitness (diet and exercise)
- (ii) possible health hazards (drinking alcohol,  
smoking and eating certain types of food).

It may be that in adolescence, pupils are beginning to view health behaviour in terms of 'things that are good for you' and 'things that are bad for you'. This is borne out to some extent by the results of a McQuitty Elementary Linkage Analysis (see Appendix 01, page A01.4) carried out on the Factor intercorrelations (Table 69). Two clusters of factors emerged, as follows:

***Cluster 1: Perceptions of fitness (diet and exercise)***



***Cluster 2: Perceptions of potential health hazards (alcohol, smoking and eating certain types of food)***



It must be noted, however, that the correlations between the factors are extremely low, thus there is only minimal evidence of an adolescent 'health concept' emerging.

## CONCLUSIONS

It will be recalled from Chapter 1 (page 1.16) that the author set out to produce valid and reliable instruments for the purpose of investigating Beliefs, Social Pressures and health Intentions (hence health Behaviour) with regard to drinking alcohol, smoking cigarettes, keeping fit and diet. The reliability of the instruments produced proved to be very satisfactory. Their face and content validity was assured by the process of scale development. A type of convergent and discriminant validity was demonstrated and they were shown to have good criterion-related validities, demonstrating the internal and external validity of the Ajzen and Fishbein model in this context. With regard to external validity, the correlations between intentions and reported behaviour were particularly satisfactory, showing that health intentions as measured in this study closely correspond with health behaviour in the 'real world' (see Chapter 6).

In this concluding Chapter, the results of the study will be summarised. Their implications for the Health Education curriculum, hence the appropriateness of the approach of recently published programmes, will then be considered. Finally, implications for the future development of Health Education programmes will be discussed in terms of the promotion of a healthy lifestyle, as this is currently conceived.

### Summary of results

A statistically significant amount of the variance in adolescents' intentions with regard to the four topics is explained by a weighted combination of the variance in their beliefs and reported social pressures. It should be noted, however, that because of the correlations between the independent variables, the addition of the second one to the analyses generally led to only a modest increase in the amount of variance explained in intentions. The external validity study indicates that intentions correspond closely with behaviour. Although the values of  $R^2$  are similar in magnitude to those frequently reported in social and educational research in connection with adolescents, using correlation techniques (pages 10.1 and 10.2), they are lower than those reported by researchers using the Ajzen and Fishbein model with adults. The suitability of this model, which purports to be all-embracing, is therefore questioned when applied to immature subjects (pages 10.3 and 10.4): it is clear from interviews with youngsters (Appendix 10) that they are not free to behave as they might wish but are governed by what is provided for them and the opportunities which arise. This 'opportunity' element is not allowed for in the model.

This study indicates that, in general, the intentions of adolescents to drink alcohol increase with age. At the same time their beliefs become less negative and they experience more social pressure to drink.

Adolescents' intentions to smoke cigarettes also increase with age and while the nature of their beliefs, which are

negative, does not change with age, they experience greater social approval of smoking as they get older.

In general the intentions of young people to keep fit are quite strong and there is no significant change with age. Their beliefs about it are positive, but they do not experience very much social pressure to take part in regular exercise.

Overall, the intentions of adolescents to eat protein are strong, this is accompanied by strongly positive beliefs about protein foods and some parental pressure to eat them. Intentions to eat dietary fibre are not very strong. Beliefs about eating fibre are somewhat indifferent and young people do not experience very much parental pressure to eat it. They do not intend to eat a lot of extra salt. Their beliefs about extra salt are negative and furthermore they do not experience parental pressure to eat it. Their intentions to eat green vegetables and fruit are strong, at the same time their beliefs about them are positive and they experience considerable parental pressure to eat them. Young people are quite likely to eat sweet foods, but their beliefs about them are negative and furthermore they do not experience parental pressure to eat them. They have strong intentions to eat fatty foods. Their beliefs about them are positive and they experience some parental pressure to eat them.

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The factor analysis of the scale and topic inter-correlations provides an indication of the extent and ways in which adolescents are integrating their feelings about



these four topics into some sort of concept of a 'health lifestyle'. There is some evidence of a clustering of perceptions of fitness, concerning diet and exercise and perceptions of potential health hazards, concerning drinking alcohol, smoking and eating certain types of food (see page 10.19). However, the components of these clusters are only minimally linked and at best may be viewed as embryonic health concepts only. There is little evidence that adolescents generally have any notion of what a healthy lifestyle might be in relation to these topics or of any overall concept of risk or benefit involving them.

### **Implications for the Health Education curriculum**

Current Health Education programmes in schools are based on the premise that beliefs and social pressures are the main determinants of adolescent health behaviour and that strategies designed to modify these beliefs and perceptions of social pressure will therefore bring about changes in health behaviour (see pages 1.13 to 1.16). The results of the regression analyses strongly support this premise, hence the use of these teaching strategies in school and the use of the instruments prepared for this study in their evaluation.

It is appropriate therefore now to consider the curricular implications arising from the results of the analyses of the survey data set out in Chapter 9 and discussed in Chapter 10, in the light of what is currently considered to be a healthy life style. Brief reference will also be made to the information about beliefs and referents included in the tables in Chapter 4.

This will now be done for each topic in turn.

### ***Alcohol***

Beliefs about drinking alcohol become significantly less negative as pupils get older. There are indications in Tables 1 and 2 (pages 4.8 and 4.9) that lower school pupils are concerned about the adverse affect of alcohol on physical and social control: they worry about making tactless remarks, behaving irresponsibly, having accidents and being vulnerable when under its influence. They also worry that drinking alcohol will make them sick and ill. On the other hand, they seem to like the sweet taste and remark that drinking makes them feel and look more mature: they may start drinking alcohol for these reasons. As youngsters become more experienced drinkers, they appear to become less worried about being out of control and feeling ill as a consequence of drinking and stress rather the perceived advantages, such as feeling relaxed, happy and confident and getting on better with people in convivial circumstances. They also appear to become more concerned about the cost.

Thus there are indications that the younger adolescents fear the effects of alcohol, possibly because of what they have been told by adults or observed of adult behaviour. When they have had some personal experience of drinking, these fears seem to diminish or are countered by the perceived benefits.

The implications of this pattern of developing beliefs for the curriculum in Health Education are that young

adolescents should be given an honest and balanced account of the effects of drinking alcohol. If they are presented with exaggerated 'shock horror' information, they will in due course discover it to be false and may in consequence be inclined to disregard the very real hazards. Teaching should rather be concerned with the concept of drinking within 'sensible limits' and the physical and social consequences of exceeding them.

This concept of 'sensible limits' is proposed publicly for adults by the Health Education Council in recently published posters and booklets. The following quotations taken from HEC material illustrate this concept:

'Drink two or three pints of beer, two or three times a week - or the equivalent wine or spirits - and you could go on enjoying a drink for the rest of your life. Drink five or more pints of beer a day - or their equivalent - and you could be heading for trouble. You could be starting to ruin your health.' (HEC Poster AL9P, undated)

'But there's good news. By sticking to sensible limits, you'll avoid damaging your health, waking with a headache, being involved in accidents, harming relationships and hurting your pocket.

And another piece of good news. There is some evidence that drinking within sensible limits (...) may even provide some protection against heart attacks and high blood pressure.' (HEC AL7, undated)

Although parents and friends emerged as the significant referents (see Table 3 page 4.12), lower school pupils are also influenced by their immediate and extended family, grandparents, aunts, uncles and siblings, indicating a need for health promotion in the community in general. The influence of peers increases with age, reinforcing the need for programmes in school designed to help young people resist peer group pressures to conform to excessive

drinking.

Thus alcohol education should be included for all year groups in schools since this study indicates that intentions to drink and social approval of drinking both increase with age while beliefs about alcohol become less negative. The Alcohol Education Syllabus (TACADE/HEC 1984) attempts to fulfil this need.

### **Smoking**

Mean beliefs about smoking are negative and do not change significantly with age. Within this apparent constancy, however, information in Chapter 4 (Tables 4 and 5 pages 4.14 and 4.15) suggests that there may be several contrary trends. While the desirability of smoking as a means of looking and feeling 'grown up' is mentioned less frequently as the pupils get older, the reassuring implications of this are countered by a decrease in the frequency with which a fear of damage to health is mentioned. At the same time the benefits of smoking as a means of establishing and cementing social relationships are remarked upon with increasing frequency. However, as adolescents get older, more of them appear to worry about the social impact of the smell of tobacco smoke.

Unlike Alcohol, no safe limits are suggested by health educators for Smoking. The message is very clear: smoking can severely damage the health of the smoker and the people around him or her. The contents of the curriculum must therefore be designed to press home this message by any effective means. Ways have to be found to negate the image

of maturity associated with smoking and to stress the un-sociability of the smell of cigarette smoke on the hair, clothes and breath. It is interesting to note that much anti-smoking advertising aimed at young people emphasises these immediate unpleasant social aspects, for example 'Kiss a non-smoker and taste the difference' (HEC poster, undated).

The mean perceived social approval for smoking increases with age but there is no systematic change in the identity of significant referents (see Table 6 page 4.17). It must be noted, however, that with the exception of upper school boys, the beta weights (see Tables 27 a,b,c) indicate that social approval has a more powerful influence on intentions to smoke than beliefs about smoking. In the work of Fishbein, it is relatively uncommon to find social influence having such a strong and consistent effect on intentions. For all the other topics included in this present study, beliefs overall have the stronger influence. Thus the results of this study strongly reinforce the need, already acknowledged by health educators, to help young people to resist social influences to smoke.

To summarise, Health Education programmes about smoking are undoubtedly needed in schools. Materials which reiterate the dangers of smoking may well serve to make adolescents' beliefs even more negative, and hence influence them more strongly not to smoke. But there is a much greater need to help pupils resist social influences to smoke and to speak out against the smoking habits of other people. The findings of this study thus support the strategies of

recently published Health Education programmes, which concentrate on helping young people to resist social pressures to smoke whilst at the same time continuing to present the facts about the disadvantages and physiological dangers of smoking. Most published Health Education courses in Smoking Education are directed at the younger children in secondary schools. The evidence in this study, however, suggests that the campaign should continue throughout the school, as intentions to smoke gradually increase with age.

### ***Keeping fit***

Mean Beliefs about keeping fit are positive and do not vary significantly with age. There is very little emphasis on the need for physical exercise in most published Health Education courses. However, Physical Education is a compulsory part of the curriculum in schools and all pupils will be involved in it until the age of 16 years. Considering the information in Chapter 4 (Tables 7 and 8 pages 4.19 and 4.20), whereas some lower school pupils remarked that they enjoyed the competition in sport, this was not endorsed by older pupils. Some of the younger pupils also raised specific objection to having to go out to games and cross country runs in foul weather: older pupils mentioned this much less frequently. When asked about this, the older pupils explained that they had 'ways and means' of avoiding going out in bad weather.

This study indicates that intentions to keep fit are quite strong whilst young people are still in school. But there is evidence in other studies (see page 1.5) that their involvement in physical activity decreases after they leave

school and there is some evidence that their fitness also deteriorates. Their lack of enthusiasm for two of the characteristic features of school Physical Education, contrived competition and unnecessary discomfort, may well contribute to this. Teachers of Physical Education should take note of this and of their relative unpopularity with some pupils, who state '...they make you do it even if you are not well ... it's hard to get out of games at school.' (page 4.22).

This all calls for a positive input into Health Education programmes, backed up in Physical Education classes, emphasising the need for regular *enjoyable* exercise throughout life and the importance of keeping the body fit.

Perhaps the following HEC recommendations contained in the booklet 'Beating Heart Disease' (HEC, undated) for adults are appropriate also in school.

'Once you have found the form of exercise which you enjoy, try to do it

**Often enough** - 2 or 3 times a week for 20 - 30 minutes at a time

**Hard enough** - to make you fairly breathless, but not gasping for breath

**Long enough** - it must become part of your life. For good.'

This type of exercise schedule is recommended in other publications, e.g. Fitness and Exercise (Flora Project F55A, undated) and Stress Pack (Crusader Insurance 1984).

**Diet**

It will be recalled that this topic was sub-divided into six components: foods rich in protein, dietary fibre, added salt, green vegetables salads and fruit, sweet foods and added sugar, foods with a high fat content. These categories of food were included because they reflected the concerns expressed in the NACNE Report (1983).

The indications in the information set out in Chapter 4 (Table 10 and the comments which follow), concerning differentiation and changes with age in beliefs about these categories of food, were generally not supported by the survey data. Tables 12 to 18 (pages 4.28 to 4.34), however, suggest that pupils are more concerned about the taste of food than any other single factor. They have vague ideas about which foods are fattening and which are good for slimmers, which are 'good for you' and which are 'bad for you'. But only 19% of the comments about fats and 6% of those about sugar mention their connection with heart disease. This indicates that there is a need for a Health promotion input in schools concerning the link between diets high in fat and sugar and coronary heart disease.

Table 19 (page 4.35) indicates that parents overwhelmingly are the significant referents in respect of adolescents' diet. Grandparents, however, also influence the eating habits of lower and middle school pupils to some extent. According to the youngsters, this influence is often of a detrimental nature, grandparents giving large quantities of sweets and fizzy drinks. This emphasises the need for community-based Health Education programmes.



In the light of what is currently considered to be a 'healthy diet', this study reveals that young people's intentions, beliefs and reported social pressures concerning protein and green vegetables and fruit are in line with good practice, as are their beliefs and perceived social pressures with respect to sweet foods. However, it would appear that they need to be encouraged to eat more fibre and less fatty foods and sweet foods. On the whole, these findings with respect to diet agree with those of the NACNE Report (1983) and this indicates that diet information should be included in the school curriculum. At present, this information is usually included in the syllabuses for Home Economics and Human Biology. It is the custom in comprehensive schools for pupils in the third year to choose their curriculum options for the rest of their compulsory schooling. Those who do not opt for Home Economics or Human Biology will thus not be taught about diet after the age of 13 years. This suggests that 4th and 5th year Social Education programmes (which are compulsory for all pupils in most schools) should include some units on diet. They should also include information about 'hidden' salt, sugar and fats in manufactured foods. There is a need for new published resources to help teachers tackle this topic in an interesting fashion.

The 'hidden curriculum' in school is also of great significance. All of the survey schools relied to some extent on income from tuck-shops selling sweets, chocolates, sweet biscuits, fizzy drinks, and crisps. They had all adopted a 'cafeteria' style of school meals where chips,

Mars Bars and fizzy drinks were much in evidence, with only a token few 'salads' consisting usually of a slice of tomato and a tired lettuce leaf. In these schools there is little encouragement or even opportunity to put into practice the dietary principles taught in Health Education. Worse, some of the cooking witnessed in the Home Economics departments in these schools featured foods high in 'hard' fats, sugar and white flour.

### **Promoting a healthy lifestyle**

Accepting that there is genuine cause for concern over the 'health lifestyle' being developed by some adolescents, it is proposed now briefly to consider the extent to which programmes of Health Education, which are solely school-based, can be effective when the 'opportunity' element is evidently so important. To bring about any fundamental change in a lifestyle may require a change of social context. For adolescents to change their social context, which centres mainly on the family and local community is virtually impossible. What is taught in Health Education classes in school is likely to be less effective if it is in conflict with the adolescent's home and neighbourhood values and attitudes. Pupils will be offered knowledge about healthy lifestyles and also how to resist social pressures to behave in ways detrimental to their health, but how far will they receive and value these messages and be able to act upon them?

It follows that, to maximise effectiveness, Health Education programmes should be aimed at adolescents and their families or at adolescents and the community in general. There are

indications that this is beginning to happen. For example, the Family Smoking Project (HEC 1984b) produces a leaflet for parents, which is intended to be distributed before the work on smoking begins in school. This leaflet urges parents to support the work in school and to talk to their children about the dangers of smoking. It also emphasises the important influence of parents on their children's smoking behaviour.

Another project which also takes Health Education outside the classroom is the 'Slough Health Habit' (East Berkshire Health Authority, 1984). Launched in the Summer of 1984, its overall objective is to reduce morbidity and mortality from arterial disease and it is targeted at the population of Slough, i.e. the whole community. Its aims are to:

- 1) decrease overall fat consumption;
- 2) increase fibre content in the diet;
- 3) promote cessation of smoking;
- 4) increase awareness of hypertension and its control;
- 5) promote regular exercise and the maintenance of an ideal weight;
- 6) promote awareness of the effects of stress;

The strategies employed are:

- a) a substantial multi-media mass promotion programme;
- b) a community self-help programme within particular target groups e.g. schools and colleges, industry and local authorities, health workers and other community groups.

The promotion is to be sustained at an intense level for two years initially. The programme will be evaluated by questionnaire and by objective methods (e.g. the measurement of blood pressure). A record of arterial disease in Slough

will then be compared with similar records in Reading (the control town), in order to see if there has been any relative improvement in the Slough population.

It seems to me that the way forward is to combine the new, imaginative and evidently appropriate school Health Education programmes with family and community schemes. I have talked to several classes of adolescents in schools in the Slough area. Most of them are aware of this promotion in their town and at least part of the message is getting through to many of them. For example, second year pupils in a secondary modern school which I visit are adamant about the dangers of eating too much animal fat, though some without being able to explain why. They are also enthusiastic about the various competitions being organised, particularly the ones involving sporting activities. They mention that their fathers especially are showing an active interest in the family diet and are taking up jogging.

In this way the values of the community may change, so that they agree with the messages being put over in Health Education courses in schools, which should then in consequence, be more effective.

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## **APPENDICES**

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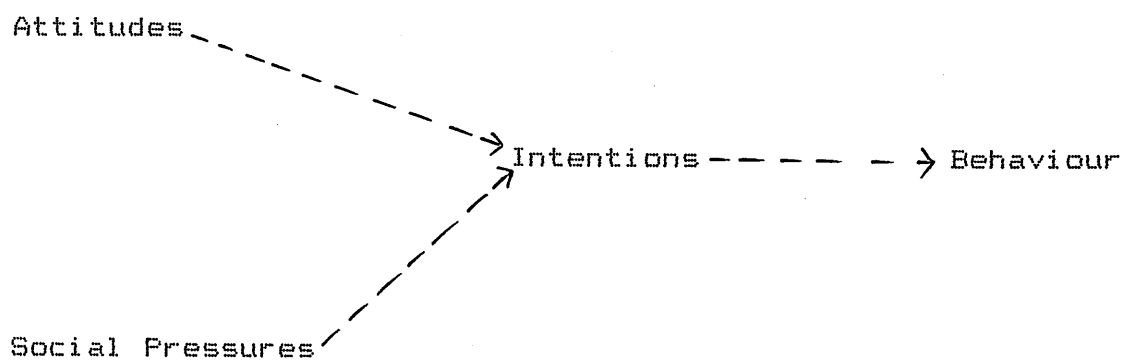
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Appendices 02, 03, 05, 06, 08 and 09 has been rearranged in  
order to conform with University requirements for the  
presentation of theses. This has resulted in some crowding  
to the right hand side of the pages not present in the  
originals.

# APPLYING TRADITIONAL LIKERT ATTITUDE SCALING TO THE AJZEN AND FISHBEIN MODEL

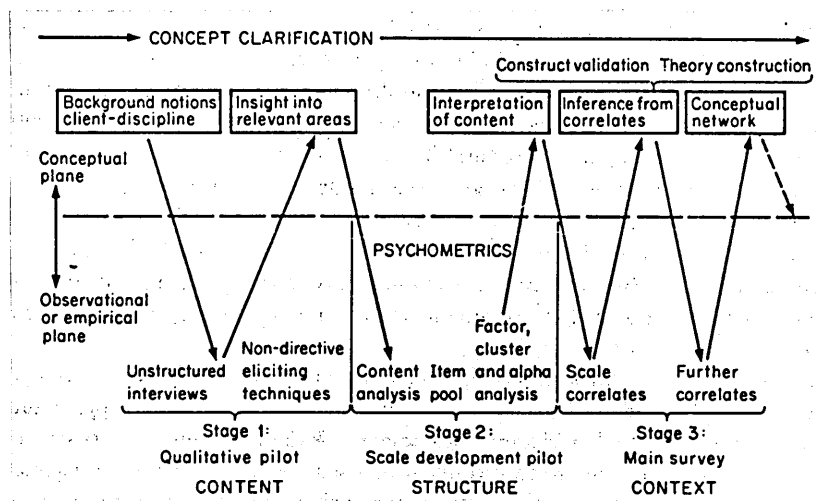
Ajzen and Fishbein (1980, p.42) claim that a person's Intentions (expressed in terms of action, target, context and time) closely correspond with subsequent Behaviour. Intentions are seen as an outcome of: a) Attitudes towards the Behaviour; and b) perceptions of Social Pressures to behave in particular ways.



Accepting the underlying principles of the Ajzen and Fishbein Model, it was decided to attempt to use traditional Likert-type attitude scaling methods to measure both Attitudes and Social Pressures towards particular 'health' behaviours. Intentions would be measured in terms of action, target, context and time, as stipulated by Ajzen and Fishbein. Regression analysis would then be used in establishing the relative importance of Attitudes and Social Pressures in determining Intentions in relation to these health behaviours.



The steps in the construction of a Likert attitude scale can be represented by the following figure.



(Reproduced from McKennell 1974 p.10)

### Stage 1: Collection of items for the pilot survey

In several comprehensive schools non directive techniques were used to elicit from adolescents:

- Beliefs about what behaviours affect health;
- Social Pressures they experience with regard to behaviour which may affect health.

Approximately 800 statements were collected concerning: drugs (alcohol, tobacco, solvents, cannabis etc.); diet; physical fitness; hygiene; sexual behaviour. It was decided to limit the investigation to: smoking tobacco; drinking alcohol; diet; and physical fitness; that is aspects of 'preventative medicine', avoiding sensitive issues such as illegal drugs and sexual behaviour. Approximately 500 different statements concerning these topics were assembled.

**Stage 2: Item selection**

Oppenheim (1966, p.116) suggests that item pool selection may be regarded as a sampling process. The total attitude cluster to be measured will contain many sub-areas and the actual statements collected will represent but a fraction of the hypothetical totality of statements that might have been collected. He suggests that some statements from each subgroup should be included in the pilot scale because at this stage it is not known which sub-areas will have the most powerful correlation with the remainder of the attitude cluster and which will be peripheral.

The 500+ statements collected were roughly categorised as follows:

- 1) Smoking - Beliefs
- 2) Smoking - Social pressures
- 3) Drinking Alcohol - Beliefs
- 4) Drinking Alcohol - Social pressures
- 5) Diet - Beliefs
- 6) Diet - Social Pressures
- 7) Physical Fitness - Beliefs
- 8) Physical Fitness - Social Pressures

Each of these categories could be divided into several subsets. For example, statements about with smoking beliefs:-

- a) permanent damage to health e.g. cancer, smokers cough, effect on pregnant women etc.;
- b) short-term discomfort e.g. watery eyes;
- c) calming nerves / helping concentration / relieving depression and tension;
- d) smoking addiction / habit forming / hard to give up etc.;
- e) cost / waste of money;
- f) the effects of smoking on sport, activity, fitness;
- g) beliefs concerning personal freedom of choice;
- h) causing yellow teeth, fingers etc.;
- i) of a miscellaneous kind.

Statements were selected from each subset using the criteria and suggestions of Edwards (1957), Oppenheim (1966), Moser and Kalton (1971), Summers (1971) and McKennell (1974). Sequencing and scaling were carried out according to the principles set out by Kalton, Collins and Brook (1977). Thus an item pool was established for use in a pilot survey, the purpose of which was to produce a refined scale. Fifty-one items were selected for the 'common pool', to be answered by all pupils: a further seventeen items were selected for the 'extended scale' to be answered only by pupils aged 14 to 18 years. A copy of the first draft of the questionnaire appears as Attachment 1 to this Appendix.

#### **Piloting the first draft**

The pilot survey was completed by approximately one hundred pupils aged 11 to 18 years under strict administrative conditions. They were afterwards interviewed in small groups. The direction of scoring of the questionnaires was established, low scores indicating behaviour detrimental to health and vice versa. Item means and standard deviations and inter-item correlations were computed. A McQuitty's (1957) Elementary Linkage Analysis (ELA) was performed on the resulting matrix of intercorrelations.

This first attempt at piloting was useful in three ways:

- 1) The interviews revealed what pupils thought of the survey in terms of instructions, language, length and format of responses. It also revealed ambiguities.
- 2) The means, standard deviations and inter-item correlations revealed items which were unsatisfactory because of:

- a) limited item variance, e.g. those with high or low means together with very small standard deviations; or
  - b) consistently low correlations with other items.
- 3) The inter-item correlations and the ELA suggested that future analyses should be in terms of the Ajzen and Fishbein model: the items relating to 'beliefs' about health behaviour should be analysed separately from those relating to 'social pressures'.

### **Piloting the second draft**

For the second draft of the questionnaire, items were modified according to what pupils had said in the interviews, and items found to be statistically unsatisfactory were removed. It was also decided that further items could be added, since pupils had not found completion of the first draft an arduous task. The 'pool content' was increased to fifty-five items and the 'extended scale' remained as seventeen, making seventy-two items (four pages) altogether. Examination of the first draft of the survey revealed that in several places there were sequences of items which were 'keyed' in the same direction: The items were re-shuffled therefore to avoid 'response sets'.

A new version of the questionnaire was prepared incorporating the above amendments and appears as Attachment 2 to this Appendix.

The new version was tried out with:

- 80-100 pupils aged 12-13 years;
- 80-100 pupils aged 14-15 years;
- 80-100 pupils aged 16-18 years.

The samples were taken from several different secondary schools.

Three hundred copies of the second pilot survey were printed, one hundred of which included only 'common pool' items (No.1 to No.55) to be completed by pupils aged 11 - 13 years and two hundred of which included 'common pool' and 'extended scale' items (No.56 to No.72) to be completed only by pupils aged 14 - 18 years. A piloting sample of 250 pupils of 'mixed ability' from several Berkshire Comprehensive Schools completed these questionnaires.

### ***First analysis of data***

Means and standard deviations were specified. Inter-item correlations were then computed and factor analysed on the 'Belief' items (Belief) and 'Social Pressure' items (Social Pressure) separately, in accordance with the Ajzen and Fishbein model. On examination, several items seemed to reflect both 'Beliefs' and 'Social Pressures' and were therefore included in the analyses of both scales, in order to determine where they best fitted. Factor analysis procedure PA2 was specified, with rotations both to orthogonal and oblique solutions. PA2 automatically replaces the main diagonal elements of the correlation matrix with communality estimates, thus adjusting the data to allow for unreliability. The program was specified for the following groups of items and ages.

#### ***(i) Belief items***

1. All belief items -  
respondents aged 14 to 18 yrs.
2. Common pool items -  
all respondents aged 11 to 18yrs.

**(ii) Social Pressure items**

1. All social pressure items - respondents aged 14 to 18 yrs.
2. Common pool items - all respondents aged 11 to 18 yrs.

**Means and standard deviations**

These are tabulated as Attachment 3 to this Appendix.

**(i) All items - Respondents aged 14 to 18 years.****Means**

With the exception of two, all the item means fell between 2 and 4. The items with a mean outside of this limit were 'Physical exercise is good fun' (No.55), mean = 4.1; 'Most young people buy sweets and snacks' (No.39), mean = 1.9.

**Standard deviations**

With the exception of one item, the standard deviations lay between 0.9 and 1.6. The item with a S.D. outside this limit was No.39, S.D.=0.6 (see Table 1, Attachment 3.)

**(ii) Common Pool items (No.1 to No.55)  
Respondents aged 11 to 18 years.****Means**

The item means fell between 2 and 4, with the exception of the two items mentioned above (No.55 and No.39) and a third item, 'My parents would hit the roof if I smoked at home' (No.40), mean = 4.1.

**Standard deviations**

The standard deviations of these items fell between 0.9 and 1.5 with the exception of two items No.39, as above, S.D.=0.7 and No.50, "Young people like to try new sweets and

snacks advertised on T.V.", S.D.= 0.8 (see Table 2, Attachment 3).

### **Conclusions**

Items No.39, No.55 and No.50 were 'new' items, not present in the first pilot survey. Their means and standard deviations indicate that they are not suitable for inclusion in the final scales. The mean of item No.40, was 4.00 in the first pilot survey: it would appear to be unsuitable for inclusion in the final instrument.

### **Factor analysis**

Child (1970) suggests that items with loadings on a factor of greater than plus or minus 0.5 define the factor, and items with loadings of between 0.3 and 0.5 (plus or minus) add detail to this definition. Thus items with factor loadings of greater than plus or minus 0.3 were noted and 'factor definitions' were attempted. The pattern of loadings which resulted from the oblique rotations were, on the whole, more coherent than those which resulted from the orthogonal rotations, more items having a logical association with the main 'theme' of the factor and fewer not reflecting the 'theme' at all. It might be expected that rotations in which a rigid orthogonality was imposed would result in the inclusion in a factor of items whose correlation is the result of spurious error variance. For this reason, factors resulting from PA2 followed by an oblique rotation will be considered in more detail, although the correlation between the factors could be clearly seen in the 'overlap' in definition between the factors emerging from each analysis.

**Analysis 1: Factor Analysis of all Belief Items:  
Respondents aged 14 to 18 years. n = 157**

Twelve factors emerged, five of which had an Eigen value of 1 or >1, taking up 70.7% of the variance in the data.

**TABLE A01.3: Summary of Factor Analysis 1**

---

Factor	% variance	Factor definition
1	29.0	Views about smoking
2	14.3	Views about diet and keeping fit
3	10.2	Physical effects of alcohol and smoking
4	9.7	Views about drinking alcohol
5	7.5	Keeping slim

---

**Analysis 2: Factor Analysis of Common Pool Belief Items -  
All Respondents aged 11 to 18 years. n = 240**

Ten factors emerged, four of which had an Eigen value of 1 or >1, taking up 72% of the variance in the data.

**TABLE A01.4: Summary of Factor Analysis 2**

---

Factor	% variance	Factor definition
1	37.5	Views about people who smoke and drink
2	15.8	Views about what you should eat
3	9.7	Benefits and fun connected with drinking
4	9.0	Mixed items - drinking and smoking

---

**Analysis 3: Factor Analysis of all Social Pressure Items -  
Respondents 14 to 18 years. n = 156**

Fifteen factors emerged, eight of which had eigen values of 1 or >1, taking up 77.3% of the variance in the data.

**TABLE A01.5: Summary of Factor Analysis 3**

---

Factor	% variance	Factor definition
1	22.7	Peer group pressure - drinking and smoking
2	17.1	Views on drinking alcohol
3	8.4	Mixed items
4	7.3	Physical appearance - Keeping fit
5	6.6	Peer group pressure - drinking
6	5.4	Views on drinking alcohol
7	5.0	Youth culture - eating
8	4.8	Mixed (i.e. non-definable)

---



**Analysis 4: Factor Analysis of Common Pool Social Pressure Items - All Respondents aged 11 to 18 years. n = 245**

Ten factors emerged two of which had Eigen values of 1 or >1 taking up 53.9% of the variance in the data.

**TABLE A01.6: Summary of factor Analysis 4**

Factor	% variance	Factor definition
1	32.9	Peer group pressure - drinking
2	21	Views about drinking

Inter-item correlations were low. In all the analyses, the communalities of the items were low, indicating a lot of unique variance (i.e. variance specific to the item and error variance. Bynner, Romney and Thomas 1979). The 'embryo' scales emerging reflected smoking, drinking alcohol, diet and keeping fit, with no 'overarching' Beliefs or perceptions of Social Pressures with respect to behaviour likely to affect health emerging.

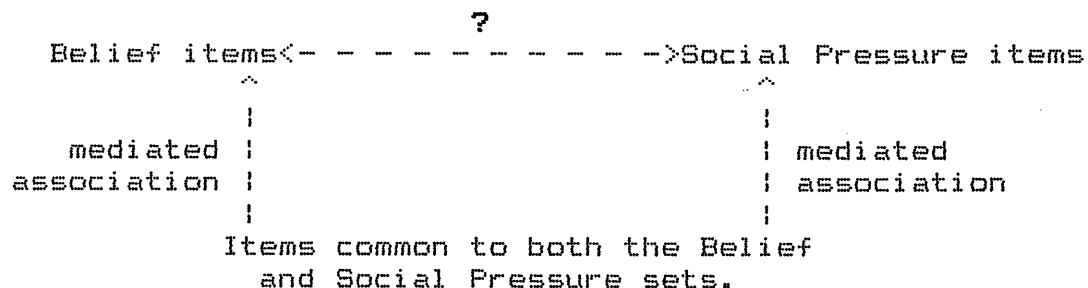
Considering Beliefs items, the factors which emerge from the analysis of all Belief items, completed by respondents aged 14 to 18 years, seemed more 'clear-cut' than those coming from the common pool items completed by all respondents aged 11 to 18 years. These latter factors each included a number of items which did not correspond conceptually to the main 'theme' of the factor. This was true for the Social Pressure analysis also, but to a lesser extent. If attitudes towards Health Behaviour change as pupils move through adolescence, the inclusion of data from pre- and post-pubertal pupils, might be expected to result in a general diminution of inter-item correlations and the weakening of the factor structure observed.

It was thought that a larger item pool might give rise to

more clear cut scales. For this reason further analyses were attempted.

### Further re-classification of Belief and Social Pressure items.

At the stage when items were being classified as being concerned with Beliefs about Health Behaviour or with Social Pressures to do with Health Behaviour, there had been some doubt as to which category some should be assigned. These items were therefore included in both analyses. On the whole they were found to have fairly high correlations with items in both the Belief sets and the Social Pressure sets. This suggested that there might be some direct association between the original Belief set and other items in the original Social Pressure sets.



On further inspection, it became evident that some the original Social Pressure items would be better classified as covert 'Belief items with Social Connotations'. The following items (originally classified as Social Pressure items) fell into this category:

4. Smoking helps you to join in with a group of young people.
  16. Most young people like eating junk food.
  23. Men who drink are manly.
  48. Boys who smoke feel tough.
  69. Keeping fit makes you look good.
  70. Smoking gives you confidence in a group.
  62. Drinking turns people nasty.
- also items: 7, 9, 10, 12, 16, 17, 29, 33, 35, 39, 44, 48, 50, 64, 65, 67, 69.

Items reflecting social pressures more overtly were not included in this category, e.g.

- 40. My parents would 'hit the roof' if I smoked at home.
- 57. You upset people if you don't accept drinks when they offer them.

### ***Second analysis of data***

A further analysis of original Belief items together with Belief items with Social Connotations was tried. There were 45 common pool items and a total of 59 items in the extended scale. PA2 followed by oblique rotation was specified on All Belief items in the Extended scale - Respondents aged 14 to 18 years, and Belief items in the Common Pool - Respondents aged 11 to 18 years. A number of well defined factors emerged from both analyses.

### ***Analysis 5: Factor Analysis of Belief items together with Belief items with Social Connotations - Extended scale - Respondents aged 14 to 18 years. n = 149***

Eighteen factors emerged, eleven of which had an Eigen value of 1 or >1, taking up 86% of the variance in the data.

**TABLE A01.7: Summary of Factor Analysis 5**

Factor	% variance	Factor definition
1	23.4	Views about smoking
2	13.5	Views about the sociable aspects of drinking and smoking
3	8.4	Views about diet and keeping fit
4	8.1	Views about drinking alcohol
5	6.2	Physical effects of various 'health behaviours'.
6	4.8	Views about exercise
7	7.4	'Youth culture'
8	3.9	Views about a healthy diet
9	3.7	Views about smoking
10	3.4	Mixed (i.e. non-definable)
11	3.2	Mixed (i.e. non-definable)

**Analysis 6: Factor Analysis of Belief items together with Belief items with Social Connotations - Common Pool - Respondents aged 11 to 18 years. n = 229**

Fourteen factors emerged five of which had an Eigen value of 1 or >1.

**TABLE A01.8: Summary of Factor Analysis 6**

Factor	% variance	Factor definition
1	32.0	Views about the social aspects of drinking and smoking
2	15.0	Views about drinking alcohol
3	8.4	Physical effects on the body of drinking and smoking
4	7.6	'Youth Culture'
5	5.7	Perceptions of a healthy diet and keeping fit

Inter-item correlations were low as noted above. The communalities of the items were also low, again indicating a lot of unique variance within the items. This was hardly likely to yield the few unidimensional scales which were sought.

This was confirmed by applying McKennell's (1968, 1979) Alpha analysis to the factors emerging from these last two analyses. The highest value obtained was Alpha = 0.55 and most of the other Alphas were well below this level. McKennell suggests that the minimum acceptable value for Alpha is 0.60. Low inter - correlations and the consequent fragmented factors had indicated that the embryo scales for Beliefs and Social Pressures concerning Health Behaviour were unsatisfactory. McKennell's Alpha analysis further confirmed the unsatisfactory nature of these scales.

On the whole, the factors emerging reflected the separate topics included in the investigation. However, two factors did present general underlying beliefs concerning 'health

behaviour', e.g.:

**Factor Title:** *Physical effects of various health behaviours.*

Drinking alcohol can slow down the brain.  
 Keeping fit helps against heart disease.  
 If you eat too much animal fat it will kill you.  
 Alcoholic drinks can ruin your liver.

**Factor Title:** *Youth Culture.*

Smoking helps you join in with a group.  
 I'd like to eat chips most days.  
 Eating healthy food is boring.  
 People drink to try and show off to their friends.

It could be argued that 8 topics were included in the pilot surveys: Beliefs about smoking, drinking alcohol, eating a healthy diet and keeping fit, and Social Pressures concerning smoking, drinking alcohol, eating a healthy diet and keeping fit. Each of these topics represented several dimensions, for example, 'Beliefs about smoking' included:

- effect on health
- positive benefits (relaxing)
- addictive nature
- money / cost
- effects on fitness / sport
- personal freedom of choice

These 'key-areas' are very similar to the 'belief' factors emerging from Marsh and Matheson's (1983) pilot survey on smoking attitude, viz:

- threat of illness
- life enhancement (fitness, energy)
- positive / negative aspects  
 (relax / irritable, money)

Eleven factors, having an Eigen value of 1 or greater than 1, emerged from the inter-correlation of the 'Belief' items together with 'Belief items with Social Connotations' in the Extended Scale of the 2nd pilot survey (Analysis 5). There may, in truth, be a large number of dimensions represented in these data. Considering the factors with only one or two items loading on them, these items may be representative of

a host of other items along the same dimension, which were either not included or not collected.

To some extent this explanation is supported by the work of Banks, Bewley and Bland (1981). Their factor analysis of 'Adolescent attitudes towards smoking' (ie. Smoking alone) produced 6 factors. Thus there may well be several factors for each of the original topics included in the pilot survey. This would suggest that young people have not yet reached the stage in their lives where they are able to draw general conclusions concerning the effects of a variety of different kinds of behaviour all likely to have an effect on their health, i.e. they see life in multidimensional terms. This is counter to 'received wisdom' in psychology e.g. Osgood (Vernon 1969) suggests that all concepts may be characterised along 3 dimensions only: evaluation or liking, potency or strength; and activity.

A relatively small number of items (n=72) representing 4 notionally independent topics (smoking, drinking, eating a healthy diet and keeping fit) along a large number of dimensions will produce spurious cross-topic factors because of random correlations and a lack of items with which they would have otherwise have properly correlated. If there are in fact a large number of dimensions in the data, a pilot survey including many more items would be necessary in order to identify them with certainty. An alternative explanation to the fragmentation of the data, may be that the items were expressed in such a way that the meaning was not clear to young people. In other words the items were too covert; a more direct approach may be more appropriate.

The 'attitude statements - beliefs' of Ajzen and Fishbein are in fact much more overt, for example:

'Continuing to drink alcohol will lead to my receiving less personal attention from the hospital staff.'	
<1-----2-----3-----4-----5>	
I, myself	I, myself
strongly	strongly
disagree	agree

Further, Bentler and Speckhart (1979), applying the Ajzen and Fishbein model, used simple statements in assessing young college students' attitudes towards social behaviour. They used statements of the following type:

What do you think about...

(beer  
drinking (wine with your friends in the next 2 weeks?  
(liquor

(alone  
smoking marijuana (with friends in the next 2 weeks?  
(at a party

('uppers'  
taking ('downers' with friends in the next 2 weeks?  
(other drugs

The Likert scale was labelled -

Terrible idea	Great idea
<----->	

### General conclusions.

Following the classical model: collecting a large number of statements from the target population; 'concept analysing' them for independence; piloting and factor analysing them; may not succeed with a large number of potentially diverse topics such as those included in this present study. If the large number of factors emerging truly represents the reality, then a very much larger pool of items may need to be piloted in order to persist with this classical approach.

Furthermore, traditional Likert attitude scales, by their very nature are composed of emotional and emotive statements that seek an emotional response. Perhaps the statements included in this pilot study were measuring 'emotional responses' to Beliefs and Social Pressures with respect to health behaviour, and not the Beliefs and Social Pressures themselves.

Although it is conceivable that traditional Likert attitude scaling might be applicable to the measurement of Beliefs concerning the separate topics, it seems most unlikely to be a satisfactory approach to the measurement of perceived Social Pressures concerning health behaviour. It was therefore decided to return to the approach to the measurement of Beliefs, Social Pressures and Intentions proposed by Ajzen and Fishbein and as subsequently developed by other researchers.



## ATTITUDES TO HEALTH BEHAVIOUR.

The purpose of this survey is to find out what you think and feel about behaviour which may affect your health. It is not a test, so there are no 'right' and 'wrong' answers. It is made up of things which have been said by young people in several different schools. We would like to know how far you agree with them.

We are not asking you to put your name on this paper since your opinions are your personal concern.

Please fill in the following:

Name of School ..... Today's date.....

Your Date of Birth..... Your Age.....

Boy or Girl?.....

## Practice Questions.

Going out to work is better than going to school.

Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
✓				

The answer we have chosen is 'strongly agree' so we have put a tick in the 'strongly agree' column. If we had chosen 'strongly disagree', we would have put a tick in that column, and so on.

Try the next one yourself:

Going to Discos is fun.

Strongly agree	Agree	Uncertain	Disagree	Strongly disagree

Each of the opinions in this survey looks like these practice ones. Read each opinion carefully, think about it, decide which one answer best fits your feelings then put a tick in that column. If you change your mind, please rub out the wrong tick, or cross it out neatly.

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1. Smoking calms your nerves.					
2. I'd like to eat chips every day.					
3. Exercise is boring.					
4. Too much alcohol rots your liver.					
5. Smoking helps you fit into the crowd.					
6. Keeping fit wears you out.					
7. Most families often have 'fry-ups'.					
8. Teen-agers drink to show off to their friends.					
9. Smoking makes your breath smell bad.					
10. You daren't tell parents what you eat at school.					
11. Drinking gets people into a good mood.					
12. Smoking should be banned in all public places.					
13. Once you start drinking a lot, you can't stop.					
14. You feel left out of it if you're not good at sport.					
15. Anyone should smoke if they want to.					
16. Drinkers often get into fights.					
17. You should drink a pint of milk each day.					
18. Smoking is a complete waste of money.					
19. I like eating 'junk food'.					
20. Girls who drink a lot are common.					

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
21. Most mothers make you eat greens and salads.					
22. Smokers kill themselves with cigarettes in the end.					
23. Alcohol helps people to relax.					
24. What teachers say about what you should eat goes 'in one ear and out the other'.					
25. I think cigarette smoke smells nice.					
26. It's too expensive to join sports clubs.					
27. Men who drink are 'macho'.					
28. I like the taste of most alcoholic drinks.					
29. Friends try to get you to smoke cigarettes.					
30. We like to eat lots of snacks in our family.					
31. People drink to try to join in with the crowd.					
32. Smokers don't care about themselves.					
33. Drinking makes people look on the bright side.					
34. Smoking is very enjoyable.					
35. Drinking helps people forget their shyness.					
36. Eating 'healthy' food is a drag.					
37. It's fun to drink alcoholic drinks.					
38. Smokers are useless at sport.					
39. Young people smoke to 'look big'.					
40. Keeping fit makes you feel good.					

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
41.Smoking is a dirty habit.					
42.My friends think that drinking is great.					
43.When you feel fit you want to go places and do things.					
44.Drinking makes you say things you don't mean.					
45.Other peoples' cigarette smoke can give you lung cancer.					
46.At school lunch, I like to eat the same things as my friends.					
47.My parents would 'hit the roof' if I smoked at home.					
48.People should be put in prison for driving when they have been drinking.					
49.I like to try new sweets and snacks advertised on T.V.					
50.My parents are very strict about not allowing me to drink at home.					
51.People who are 'hooked' on smoking can never give it up.					

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
52. You need to keep slim. .....					
53. You have to accept drinks when friends offer them. .....					
54. People who drink a lot have no self control. .....					
55. If you eat too much animal fat it will give you a heart attack. .....					
56. Exercise makes you more attractive. .....					
57. It's hard to refuse a cigarette at a party. .....					
58. Drinking turns people nasty. .....					
59. They call you 'chicken' if you dont drink at parties. .....					
60. Smoking helps you concentrate. .....					
61. Alcoholic drinks help you 'get off' with someone. .....					
62. Keeping fit helps against heart attacks. .....					
63. Drinking helps you pluck up courage at a party. .....					
64. Smoking makes you attractive to the opposite sex. .....					
65. They make fun of you if you don't drink. .....					
66. Keeping fit makes you look good. .....					
67. Smoking gives you confidence in the crowd. .....					
68. Drinking is a waste of money. .....					

## ATTITUDES TO HEALTH BEHAVIOUR.

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	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1. Smoking calms your nerves.					
2. I'd like to eat chips most days.					
3. Alcoholic drinks can ruin your liver.					
4. Smoking helps you join in with a group of young people.					
5. Once you start drinking a lot you can't stop.					
6. Keeping fit wears you out.					
7. Most families often eat fried food.					
8. Smokers' breath is disgusting.					
9. Teen-agers drink to show off to their friends.					
10. Drinking gets people into a good mood.					
11. Smoking should be banned in public places, like cinemas cafes and buses.					
12. You feel left out of it if you're not good at sport.					
13. People who drink alcohol often get into fights.					
14. Anyone should smoke if they want to: it's up to them.					
15. A lot of milk is bad for you.					
16. Most young people like eating 'junk' food.					
17. Girls who drink a lot look cheap.					
18. Mothers worry about what their children eat at school.					

NOW GO BACK AND CHECK THAT YOU HAVE TICKED ALL THE QUESTIONS

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
19. Alcohol helps people to relax.					
20. Pupils take no notice of what teachers say about what you should eat.					
21. Smokers kill themselves with cigarettes in the end.					
22. It's too expensive to join sports clubs.					
23. Men who drink are 'manly'.					
24. Most mothers make you eat greens and salads.					
25. Friends try to get you to smoke cigarettes.					
26. I like the taste of most alcoholic drinks.					
27. Smokers are useless at sport.					
28. Most families like to eat lots of snacks.					
29. People drink to try to join in with their group.					
30. Smoking is the worst habit ever.					
31. Drinking makes people look on the bright side.					
32. Eating 'healthy' food is boring.					
33. Drinking makes people say things they don't mean.					
34. It's fun to drink alcoholic drinks.					
35. Young people smoke to look grown up.					
36. People should be put in prison for driving when they have been drinking a lot.					

NOW GO BACK AND CHECK THAT YOU HAVE TICKED ALL THE QUESTIONS



	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
37. My friends think that drinking is great.					
38. Other peoples' cigarette smoke can give you lung cancer.					
39. Most young people buy sweets and snacks.					
40. My parents would 'hit the roof' if I smoked at home.					
41. It is not important to eat breakfast.					
42. Most parents are strict about not allowing you to drink alcohol at home.					
43. People who are 'hooked' on smoking can never give it up.					
44. Drinking helps people forget their shyness.					
45. Smoking is enjoyable.					
46. If you are fat you will not be happy.					
47. Smokers don't care about themselves.					
48. Boys who smoke feel tough.					
49. Drinking alcohol slows down your brain.					
50. Young people like to try new sweets and snacks advertised on T.V.					
51. Smoking is the very worst thing for pregnant women.					
52. Brown bread is horrible.					
53. T.V. programmes about smoking have 'put me off' smoking.					
54. You don't have to eat stuff that is good for you.					
55. Physical exercise is good fun.					

NOW GO BACK AND CHECK THAT YOU HAVE TICKED ALL THE QUESTIONS

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
56. You need to keep slim.					
57. You upset people if you don't accept drinks when they offer them.					
58. People who drink a lot have no self control.					
59. If you eat too much animal fat it will kill you.					
60. Exercise makes you more attractive.					
61. It's hard to refuse a cigarette at a party.					
62. Drinking turns people nasty.					
63. They call you 'chicken' if you don't drink at parties.					
64. Smoking helps people concentrate.					
65. Alcoholic drinks help you 'get off' with someone.					
66. Keeping fit can help against heart attacks.					
67. Drinking helps you pluck up courage at a party.					
68. They make fun of you if you don't drink.					
69. Keeping fit makes you look good.					
70. Smoking gives you confidence in a group of people.					
71. Drinking is a waste of money.					
72. Smoking can spoil a party.					

NOW GO BACK AND CHECK THAT YOU HAVE TICKED ALL THE QUESTIONS.

## PILOT 2

TABLE 1 : MEANS AND STANDARD DEVIATIONS : 14+, ALL ITEMS.

N = 133.	Type	Mean	S.D	Scoring SA/SD
1. Smoking calms your nerves.	BS	3.1	1.2	1/5
2. I'd like to eat chips most days.	BPW	3.6	1.1	1/5
3. Alcoholic drinks can ruin your liver.	BA	3.9	1.0	5/1
4. Smoking helps you join in with a group of young people.	SS	3.7	1.2	1/5
5. Once you start drinking a lot you can't stop.	BA	3.1	1.1	5/1
6. Keeping fit wears you out.	BPW	3.7	1.1	1/5
7. Most families often eat fried food.	SPW	2.8	1.1	1/5
8. Smokers' breath is disgusting.	BS	3.8	1.3	5/1
9. Teen-agers drink to show off to their friends.	SA	2.7	1.2	1/5
10. Drinking gets people into a good mood.	BA/ SA	2.9	1.2	1/5
11. Smoking should be banned in public places, like cinemas cafes and buses.	BS	3.2	1.5	5/1
12. You feel left out of it if you're not good at sport.	SPW	2.8	1.1	5/1
13. People who drink alcohol often get into fights.	BA/ SA	3.2	1.1	5/1

	Type	Mean	S.D	Scoring
14. Anyone should smoke if they want to: it's up to them.	BS	2.1	1.0	1/5
15. A lot of milk is bad for you.	BPW	2.2	1.0	5/1
16. Most young people like eating 'junk' food.	SPW	2.2	0.9	1/5
17. Girls who drink a lot look cheap.	SA	2.8	1.1	5/1
18. Mothers worry about what their children eat at school.	SPW	3.5	1.1	5/1
19. Alcohol helps people to relax.	BA/ SA	2.7	0.9	1/5
20. Pupils take no notice of what teachers say about what you should eat.	SPW	2.5	1.0	1/5
21. Smokers kill themselves with cigarettes in the end.	BS	3.3	1.2	5/1
22. It's too expensive to join sports clubs.	BPW	3.2	1.1	1/5
23. Men who drink are 'manly'.	SA	4.0	0.9	1/5
24. Most mothers make you eat greens and salads.	SPW	3.2	1.2	5/1
25. Friends try to get you to smoke cigarettes.	SS	3.1	1.3	1/5
26. I like the taste of most alcoholic drinks.	BA	2.8	1.2	1/5
27. Smokers are useless at sport.	BS	2.6	1.2	5/1
28. Most families like to eat lots of snacks.	SPW	2.8	0.9	1/5
29. People drink to try to join in with their group.	SA	2.8	1.1	1/5

	Type	Mean	S.D	Scoring
30.Smoking is the worst habit ever.	BS	3.3	1.4	5/1
31.Drinking makes people look on the bright side.	BA/ SA	3.0	1.0	1/5
32.Eating 'healthy' food is boring.	BPW	3.7	1.1	1/5
33.Drinking makes people say things they don't mean.	SA	3.9	0.9	5/1
34.It's fun to drink alcoholic drinks.	BA	3.1	1.1	1/5
35.Young people smoke to look grown up.	SS	2.2	1.3	1/5
36.People should be put in prison for driving when they have been drinking a lot.	BA	3.3	1.1	5/1
37.My friends think that drinking is great.	SA	3.0	1.0	1/5
38.Other peoples' cigarette smoke can give you lung cancer.	BS/ SS	3.7	0.9	5/1
39.Most young people buy sweets and snacks.	SPW	1.9	0.6	1/5
40.My parents would 'hit the roof' if I smoked at home.	SS	3.8	1.3	5/1
41.It is not important to eat breakfast.	BPW	3.9	1.1	1/5
42.Most parents are strict about not allowing you to drink alcohol at home.	SA	2.9	1.2	5/1
43.People who are 'hooked' on smoking can never give it up.	BS	2.8	1.3	5/1

	Type	Mean	S.D	Scoring
44. Drinking helps people forget their shyness.	SA		Accidentally left out of analyses.	
45. Smoking is enjoyable.	BS	3.6	1.2	5/1
46. If you are fat you will not be happy.	BPW/ SPW	2.3	1.2	5/1
47. Smokers don't care about themselves.	BS	2.5	1.2	5/1
48. Boys who smoke feel tough.	SS	2.7	1.3	1/5
49. Drinking alcohol slows down your brain.	BA	3.9	1.0	5/1
50. Young people like to try new sweets and snacks advertised on T.V..	SPW	2.3	0.9	1/5
51. Smoking is the very worst thing for pregnant women.	BS	4.3	1.0	5/1
52. Brown bread is horrible.	BPW	4.0	1.2	1/5
53. T.V. programmes about smoking have 'put me off' smoking.	SS	3.1	1.4	5/1
54. You don't have to eat stuff that is good for you.	BPW	3.2	1.2	1/5
55. Physical exercise is good fun.	BPW/ SPW	4.1	1.0	5/1
56. You need to keep slim.	BPW/ SPW	3.2	1.6	5/1
57. You upset people if you don't accept drinks when they offer them.	SA	3.2	1.0	1/5
58. People who drink a lot have no self control.	BA	3.4	1.0	5/1
59. If you eat too much animal fat it will kill you.	BPW	3.0	1.0	5/1

	Type	Mean	S.D	Scoring
60.Exercise makes you more attractive.	SPW	3.2	1.0	5/1
61.It's hard to refuse a cigarette at a party.	SS	3.7	1.3	1/5
62.Drinking turns people nasty.	SA	3.1	1.0	5/1
63.They call you 'chicken' if you don't drink at parties.	SA	3.3	1.2	1/5
64.Smoking helps people concentrate.	BS	3.6	1.1	1/5
65.Alcoholic drinks help you 'get off' with someone.	SA	2.9	1.3	1/5
66.Keeping fit can help against heart attacks.	BPW	3.9	1.0	5/1
67.Drinking helps you pluck up courage at a party.	SA	2.7	1.1	1/5
68.They make fun of you if you don't drink.	SA	3.4	1.1	1/5
69.Keeping fit makes you look good.	SPW	3.8	0.9	5/1
70.Smoking gives you confidence in a group of people.	SS	3.6	1.0	1/5
71.Drinking is a waste of money.	BA	3.2	1.3	5/1
72.Smoking can spoil a party.	BS	3.0	1.3	5/1

**Code**

BS = Belief-Smoking

BA = Belief-Alcohol

BPW= Belief=Personal Well-being

SS = Social Pressure-Smoking

SA = Social Pressure-Alcohol

SPW= Social Pressure Well-being.

SA/SD = Strongly Agree/Strongly Disagree



## PILOT 2

TABLE 2: MEANS AND STANDARD DEVIATIONS: ALL PUPILS, POOL ITEMS.

N = 273.	Type	Mean	S.D	Scoring SA/SD
1. Smoking calms your nerves. .....	BS	3.2	1.2	1/5
2. I'd like to eat chips most days. .....	BPW	3.4	1.1	1/5
3. Alcoholic drinks can ruin your liver. .....	BA	3.9	1.0	5/1
4. Smoking helps you join in with a group of young people. .....	SS	3.6	1.2	1/5
5. Once you start drinking a lot you can't stop. .....	BA	3.3	1.1	5/1
6. Keeping fit wears you out. .....	BPW	3.7	1.1	1/5
7. Most families often eat fried food. .....	SPW	2.8	1.0	1/5
8. Smokers' breath is disgusting. .....	BS	4.0	1.2	5/1
9. Teen-agers drink to show off to their friends. .....	SA	2.4	1.2	1/5
10. Drinking gets people into a good mood. .....	BA/ SA	2.9	1.1	1/5
11. Smoking should be banned in public places, like cinemas cafes and buses. .....	BS	3.4	1.5	5/1
12. You feel left out of it if you're not good at sport. .....	SPW	3.0	1.2	5/1
13. People who drink alcohol often get into fights. .....	BA/ SA	3.4	1.1	5/1

	Type	Mean	S.D	Scoring
14. Anyone should smoke if they want to: it's up to them.	BS	2.2	1.1	1/5
15. A lot of milk is bad for you.	BPW	2.2	1.0	5/1
16. Most young people like eating 'junk' food.	SPW	2.1	0.9	1/5
17. Girls who drink a lot look cheap.	SA	3.0	1.1	5/1
18. Mothers worry about what their children eat at school.	SPW	3.7	1.1	5/1
19. Alcohol helps people to relax.	BA/ SA	2.9	1.0	1/5
20. Pupils take no notice of what teachers say about what you should eat.	SPW	2.4	0.9	1/5
21. Smokers kill themselves with cigarettes in the end.	BS	3.7	1.2	5/1
22. It's too expensive to join sports clubs.	BPW	3.3	1.1	1/5
23. Men who drink are 'manly'.	SA	3.8	1.0	1/5
24. Most mothers make you eat greens and salads.	SPW	3.5	1.2	5/1
25. Friends try to get you to smoke cigarettes.	SS	3.0	1.3	1/5
26. I like the taste of most alcoholic drinks.	BA	3.1	1.3	1/5
27. Smokers are useless at sport.	BS	2.9	1.2	5/1
28. Most families like to eat lots of snacks.	SPW	2.8	1.0	1/5
29. People drink to try to join in with their group.	SA	2.7	1.1	1/5

	Type	Mean	S.D	Scoring
30.Smoking is the worst habit ever.	BS	3.6	1.4	5/1
31.Drinking makes people look on the bright side.	BA/ SA	3.1	1.0	1/5
32.Eating 'healthy' food is boring.	BPW	3.8	1.2	1/5
33.Drinking makes people say things they don't mean.	SA	3.9	0.9	5/1
34.It's fun to drink alcoholic drinks.	BA	3.3	1.1	1/5
35.Young people smoke to look grown up.	SS	2.0	1.2	1/5
36.People should be put in prison for driving when they have been drinking a lot.	BA	3.5	1.2	5/1
37.My friends think that drinking is great.	SA	3.1	1.0	1/5
38.Other peoples' cigarette smoke can give you lung cancer.	BS/ SS	3.7	0.9	5/1
39.Most young people buy sweets and snacks.	SPW	1.8	0.7	1/5
40.My parents would 'hit the roof' if I smoked at home.	SS	4.1	1.2	5/1
41.It is not important to eat breakfast.	BPW	3.9	1.0	1/5
42.Most parents are strict about not allowing you to drink alcohol at home.	SA	3.0	1.3	5/1
43.People who are 'hooked' on smoking can never give it up.	BS	3.1	1.4	5/1

	Type	Mean	S.D	Scoring
44. Drinking helps people forget their shyness.	SA			Accidentally left out of analyses.
45. Smoking is enjoyable.	BS	3.7	1.2	5/1
46. If you are fat you will not be happy.	BPW/ SPW	2.5	1.2	5/1
47. Smokers don't care about themselves.	BS	2.7	1.1	5/1
48. Boys who smoke feel tough.	SS	2.4	1.3	1/5
49. Drinking alcohol slows down your brain.	BA	3.6	0.9	5/1
50. Young people like to try new sweets and snacks advertised on T.V..	SPW	2.1	0.8	1/5
51. Smoking is the very worst thing for pregnant women.	BS	4.3	1.0	5/1
52. Brown bread is horrible.	BPW	3.9	1.2	1/5
53. T.V. programmes about smoking have 'put me off' smoking.	SS	3.5	1.3	5/1
54. You don't have to eat stuff that is good for you.	BPW	3.4	1.2	1/5
55. Physical exercise is good fun.	BPW/ SPW	4.2	1.0	5/1

## Code

BS = Belief-Smoking  
 BA = Belief-Alcohol  
 BPW= Belief-Personal Well-being  
 SS = Social Pressure-Smoking  
 SA = Social Pressure-Alcohol  
 SPW= Social Pressure-Personal Well-being.

SA/SD = Strongly Agree/Strongly Disagree.

- 1) Do you think you will drink alcoholic drinks at home with your family in the next month?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 2) Do you think you will drink alcoholic drinks in the homes of friends or relatives in the next month?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 3) Do you think you will drink alcoholic drinks with your friends in pubs or clubs in the next month?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 4) Alcoholic drinks calm your nerves and help you to relax.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to be calm and relaxed?  
not at all important - not very important - not sure - quite important - extremely important
- 5) People should not drink and drive.  
strongly disagree - disagree - not sure - agree - strongly agree  
How dangerous do you think it is to drink and drive?  
not at all dangerous - not very dangerous - not sure - quite dangerous - extremely dangerous
- 6) If you drink a lot, you can find it hard to stop and you could become an alcoholic.  
strongly disagree - disagree - not sure - agree - strongly agree  
How serious is it if you become an alcoholic?  
not at all serious - not very serious - not sure - quite serious - extremely serious
- 7) Alcoholic drinks make you feel cheerful.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to feel cheerful?  
not at all important - not very important - not sure - quite important - extremely important
- 8) Alcoholic drinks make you feel confident.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to feel confident?  
not at all important - not very important - not sure - quite important - extremely important
- 9) Alcoholic drinks can seriously damage your health.  
strongly disagree - disagree - not sure - agree - strongly agree  
How worried are you about damaging your health.  
not at all worried - not very worried - not sure - quite worried - extremely worried
- 10) You can get aggressive and get into fights when you drink.  
strongly disagree - disagree - not sure - agree - strongly agree  
How serious is it if you get into fights?  
not at all serious - not very serious - not sure - quite serious - extremely serious

- 11) Alcoholic drinks taste nice.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is the taste to you?  
not at all important - not very important - not sure - quite important - extremely important
- 12) Drinking can make you feel 'grown up'.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to feel grown up?  
not at all important - not very important - not sure - quite important - extremely important
- 13) Alcoholic drinks cost a lot of money.  
strongly disagree - disagree - not sure - agree - strongly agree  
How wasteful is it to spend money on alcoholic drinks?  
not at all wasteful - not very wasteful - not sure - quite wasteful - extremely wasteful
- 14) You get a hangover after drinking a lot.  
strongly disagree - disagree - not sure - agree - strongly agree  
How miserable is it to have a hangover?  
not at all miserable - not very miserable - not sure - quite miserable - extremely miserable
- 15) Drinking makes you say and do things you don't mean.  
strongly disagree - disagree - not sure - agree - strongly agree  
How worried are you about saying and doing things you don't mean?  
not at all worried - not very worried - not sure - quite worried - extremely worried
- 16) Drinking helps you to be sociable with people.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to be sociable?  
not at all important - not very important - not sure - quite important - extremely important
- 17) Drinking a lot makes you sick and ill.  
strongly disagree - disagree - not sure - agree - strongly agree  
How worried are you about feeling sick and ill?  
not at all worried - not very worried - not sure - quite worried - extremely worried
- 18) Would your parents think it's alright for you to drink alcoholic drinks at home with the family in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
- 19) Would your parents think it's alright for you to drink alcoholic drinks in the homes of friends or relatives in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes

- 20) Would your parents think it's alright for you to drink alcoholic drinks with your friends in pubs or clubs in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
- 21) Generally speaking, how much do you want to do what your parents think you should do?  
not at all - not very much - not sure - quite a lot - extremely
- 22) Would your friends and other young people think it's alright for you to drink alcoholic drinks at home with your family in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
- 23) Would your friends and other young people think it's alright for you to drink alcoholic drinks in the homes of friends or relatives in the next two weeks?  
definitely no - probably no - not sure - probably yes - definitely yes
- 24) Would your friends and other young people think it's alright for you to drink alcoholic drinks with them in pubs or clubs in the next two weeks?  
definitely no - probably no - not sure - probably yes - definitely yes
- 25) Generally speaking, how much do you want to do what your friends and other young people think you should do?  
not at all - not very much - not sure - quite a lot - extremely

- 1) Do you think you will smoke cigarettes when you are alone during the next month?

definitely no - unlikely - not sure - quite likely - definitely yes

- 2) Do you think you will smoke cigarettes with friends during the next month?

definitely no - unlikely - not sure - quite likely - definitely yes

- 3) Do you think you will smoke cigarettes at a party or disco during the next month?

definitely no - unlikely - not sure - quite likely - definitely yes

*Here are some things which people say they believe about smoking cigarettes. What do you think?*

- 4) Smoking calms your nerves and help you to relax.

not sure - perhaps - fairly sure - certain

How important is it to you to be calm and relaxed?

not at all important - not very important - not sure - quite important - extremely important

- 5) Smoking can cause serious illnesses, like lung cancer and heart attacks.

not sure - perhaps - fairly sure - certain

How serious do you think these illnesses are?

not at all serious - not very serious - not sure - quite serious - extremely serious

- 6) People can get addicted to smoking cigarettes and find it hard to give up.

not sure - perhaps - fairly sure - certain

How serious do you think it is to become addicted?

not at all serious - not very serious - not sure - quite serious - extremely serious

- 7) Smoking helps you to be sociable and join in with a group of friends.

not sure - perhaps - fairly sure - certain

How important is it to you to be sociable?

not at all important - not very important - not sure - quite important - extremely important

- 8) Smoking stains your teeth and fingers.

not sure - perhaps - fairly sure - certain

How much do you care about staining your teeth and fingers?

not at all - not very much - not sure - quite a lot - extremely

- 9) Other people's cigarette smoke can give you lung cancer.

not sure - perhaps - fairly sure - certain

How much do you worry about the dangers of other people's smoking?

not at all - not very much - not sure - quite a lot - extremely



- 10) Cigarettes cost a lot of money.  
not sure - perhaps - fairly sure - certain  
How wasteful do you think it is to spend money on  
cigarettes?  
not at all wasteful - not very wasteful - not sure - quite wasteful - extremely wasteful
- 11) Cigarette smoke makes peoples' breath, clothes, hair  
etc., smell.  
not sure - perhaps - fairly sure - certain  
How unpleasant do you think is it to smell of cigarette  
smoke?  
not at all unpleasant - not very unpleasant - not sure - quite unpleasant - extremely unpleasant
- 12) Young people smoke to look 'grown-up'.  
not sure - perhaps - fairly sure - certain  
How important is it to you to feel 'grown up'?  
not at all important - not very important - not sure - quite important - extremely important
- 13) Would your parents think it's alright for you to smoke  
cigarettes when you are on your own?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 14) Would your parents think it's alright for you to smoke  
cigarettes with friends?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 15) Would your parents think it's alright for you to smoke  
cigarettes at a party or disco?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 16) Generally speaking, how much do you want to please your  
parents?  
not at all - not very much - not sure - quite a lot - extremely
- 17) Would other young people think it's alright for you to  
smoke cigarettes when you are on your own?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 18) Would other young people think it's alright for you to  
smoke cigarettes with friends?  
definitely no - unlikely - not sure - quite likely - definitely yes
- 19) Would other young people think it's alright for you to  
smoke cigarettes at a party or disco?  
definitely no - unlikely - not sure - quite likely - definitely yes

20) Generally speaking, how much do you want to please other young people?

not at all - not very much - not sure - quite a lot - extremely

In the next week I think I will:

- 1) do physical exercises which I can do alone, like jogging, aerobics, swimming, bicycle-riding, walking, etc.  
definitely no - unlikely - not sure - quite likely - definitely yes
- 2) take part in sports with other people outside school, such as squash, badminton, football, tennis, hockey.  
definitely no - unlikely - not sure - quite likely - definitely yes
- 3) spend a lot of time watching TV or just sitting around  
definitely no - unlikely - not sure - quite likely - definitely yes

*Now here are some things which people say they believe about keeping fit. What do you think ?*

- 4) Exercising keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to keep healthy ?  
not at all important - not very important - not sure - quite important - extremely important
- 5) Keeping fit gives me aches and pains in my muscles the next day.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you worry about having aches and pains ?  
not at all - not very much - not sure - quite a lot - extremely
- 6) Taking exercise keeps me in good shape.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to keep in good shape ?  
not at all important - not very important - not sure - quite important - extremely important
- 7) I find taking exercise exhausting and tiring.  
strongly disagree - disagree - not sure - agree - strongly agree  
How unpleasant is it to you to be exhausted and tired ?  
not at all unpleasant - not very unpleasant - not sure - quite unpleasant - extremely unpleasant
- 8) Keeping fit makes me feel good afterwards.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to feel good ?  
not at all important - not very important - not sure - quite important - extremely important
- 9) I find exercising enjoyable and good fun at the time.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to have fun in this way ?  
not at all important - not very important - not sure - quite important - extremely important

- 10) Sporting activities are sociable and help me to meet people.  
strongly disagree - disagree - not sure - agree - strongly agree  
How pleasant do you think it is to be sociable ?  
not at all pleasant - not very pleasant - not sure - quite pleasant - extremely pleasant

- 11) I could get injured and hurt myself doing sport.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you fear getting injured or hurting yourself?  
not at all - not very much - not sure - quite a lot - extremely

My parents would think that:

- 12) my doing physical exercises which I can do alone, like jogging, aerobics, swimming, bicycle-riding, walking, etc. is a:  
terrible idea - bad idea - not sure - good idea - great idea
- 13) my taking part in sports with other people outside school like, squash, badminton, football, tennis, hockey is a:  
terrible idea - bad idea - not sure - good idea - great idea
- 14) my spending a lot of time watching TV or just sitting around is a:  
terrible idea - bad idea - not sure - good idea - great idea
- 15) Generally speaking, how much do you want to please your parents?  
not at all - not very much - not sure - quite a lot - extremely

My friends would think that:

- 16) my doing physical exercises which I can do alone, like jogging, aerobics, swimming, bicycle-riding, walking, etc. is a:  
terrible idea - bad idea - not sure - good idea - great idea
- 17) my taking part in sports with other people outside school like, squash, badminton, football, tennis, hockey is a:  
terrible idea - bad idea - not sure - good idea - great idea
- 18) my spending a lot of time watching TV or just sitting around is a:  
terrible idea - bad idea - not sure - good idea - great idea
- 19) Generally speaking, how much do you want to please your friends?  
not at all - not very much - not sure - quite a lot - extremely

**In the next two days I think I will eat:**

- 1) Some **protein** (e.g. meat, fish, cheese, eggs, beans);  
definitely no - unlikely - not sure - quite likely - definitely yes
- 2) Some **fresh fruit**;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 3) Some **salad or fresh green vegetables**;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 4) Some **brown wholemeal bread or cereal or bran**;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 5) Quite a lot of **"sweets" or sweet snacks**;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 6) Quite a lot of **sugar** (e.g. in tea or coffee, on cereals,  
in cakes, biscuits or puddings etc.);  
definitely no - unlikely - not sure - quite likely - definitely yes
- 7) Some **crisps** or similar snacks;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 8) Quite a lot of **fried foods** like chips, sausages, beef  
burgers, bacon etc.;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 9) Extra **salt** put on my food at the table;  
definitely no - unlikely - not sure - quite likely - definitely yes
- 10) Quite a lot of **milk**;  
definitely no - unlikely - not sure - quite likely - definitely yes

\* \* \* \* \*

**What do you think of the taste of the following foods?**

- 11) Green vegetables;  
horrible - not very nice - not sure - quite nice - extremely nice
- 12) Foods like chips, sausages, beef burgers, pies etc.;  
horrible - not very nice - not sure - quite nice - extremely nice
- 13) Salad;  
horrible - not very nice - not sure - quite nice - extremely nice
- 14) Brown wholemeal bread or cereals or bran;  
horrible - not very nice - not sure - quite nice - extremely nice
- 15) "Sweets" and sweet food;  
horrible - not very nice - not sure - quite nice - extremely nice
- 16) Salt;  
horrible - not very nice - not sure - quite nice - extremely nice

- 17) Fresh fruit;  
horrible - not very nice - not sure - quite nice - extremely nice
- 18) Protein (e.g. meat, fish, cheese, eggs, beans);  
horrible - not very nice - not sure - quite nice - extremely nice
- 19) Milk;  
horrible - not very nice - not sure - quite nice - extremely nice
- 20) Crisps and similar snacks.  
horrible - not very nice - not sure - quite nice - extremely nice
- 21) How **important** is it to you to eat food that you like the taste of?  
not at all - not very much - not sure - quite a lot - very much
- \* \* \* \* \*
- 22) I need protein foods (e.g. meat, fish, cheese, eggs, beans) in order to grow and to repair my body.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to grow and repair your body?  
not at all - not very much - not sure - quite a lot - extremely
- 23) I think that protein foods are filling.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you want to eat foods that are filling?  
not at all - not very much - not sure - quite a lot - extremely
- 24) Fresh fruit is good for me and keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to eat foods that are good for you?  
not at all - not very much - not sure - quite a lot - very much
- 25) Fresh fruit is not fattening.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you worry about getting fat?  
not at all - not very much - not sure - quite a lot - extremely
- 26) Greens and salads are good for me and keep me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to eat foods that are good for you?  
not at all - not very much - not sure - quite a lot - very much
- 27) Greens and salads are good for slimmers.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you want to slim?  
not at all - not very much - not sure - quite a lot - extremely

- 28) I find brown bread and bran dry and hard to swallow.  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you that your food is easy to eat?  
not at all - not very much - not sure - quite a lot - very much
- 29) Brown bread and bran help my digestive system.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you think you need to help your digestive system?  
not at all - not very much - not sure - quite a lot - extremely
- 30) Eating sweet things and sugar rots my teeth.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you care about the state of your teeth?  
not at all - not very much - not sure - quite a lot - extremely
- 31) Sweet things and sugar are very fattening.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you worry about getting fat?  
not at all - not very much - not sure - quite a lot - extremely
- 32) Eating too much fatty food like sausages, chips, hamburgers, bacon, pastries etc., could cause me to have a heart attack when I get older.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you fear a heart attack?  
not at all - not very much - not sure - quite a lot - extremely
- 33) Eating fatty foods can make me overweight.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you worry about being overweight?  
not at all - not very much - not sure - quite a lot - extremely
- 34) A lot of salt is bad for my health.  
strongly disagree - disagree - not sure - agree - strongly agree  
How much do you worry about your health?  
not at all - not very much - not sure - quite a lot - extremely
- 35) Milk is good for me and keeps me healthy  
strongly disagree - disagree - not sure - agree - strongly agree  
How important is it to you to keep healthy?  
not at all - not very much - not sure - quite a lot - extremely

\* \* \* \* \*

36) Do your **parents** try to persuade you to eat certain kinds of food?

definitely no - unlikely - not sure - quite likely - definitely yes

37) How much do you want to do what your **parents** want you to do?

not at all - not very much - not sure - quite a lot - extremely



## SURVEY OF HEALTH BEHAVIOUR

The purpose of this survey is to find out what you think and feel about things which may affect your health. It is not a test, so there are no 'right' or 'wrong' answers. It is made up of what has been said by young people in several different schools. We would like to have your opinions.

Please fill in the following:

Name of School: \_\_\_\_\_ Date: \_\_\_\_\_

Your Age: \_\_\_\_\_ years \_\_\_\_\_ months. Your Form: \_\_\_\_\_

### Practice Questions.

Do you think you will clean your teeth carefully before going to bed tonight?

definitely no - unlikely - not sure - quite likely - definitely yes

The answer we have chosen is 'quite likely', so we have drawn a circle round it. If we were absolutely sure we were going to clean our teeth carefully tonight we would have drawn a circle round 'definitely yes', and so on.

Now try the next ones for yourself.

Cleaning teeth prevents tooth decay

strongly disagree - disagree - not sure - agree - strongly agree

How important is it to you to prevent tooth decay?

not at all important - not very important - not sure - quite important - extremely important

Each of the items in this survey is similar to these practice ones. Read each one carefully, think about it, decide which one answer suits you best and put a circle round it, using a blue or black pen. If there are any questions of which you are not sure of the answers, always draw the circle round 'not sure'.

## REFINING THE DRAFT QUESTIONNAIRES

Piloting was undertaken with groups of pupils drawn from the Lower (first and second forms), Middle (third and fourth forms) and Upper (fifth and sixth forms) age groups in a Comprehensive school. Sometimes the groups were small, consisting of between 4 and 10 pupils, in which case, immediately after completing the questionnaire, pupils discussed their impressions in detail with the author: their comments were carefully noted. For the purpose of trying out the scoring of responses, however, three classes (approximately 30 pupils in each), one from each age group, completed the questionnaires.

After each piloting session, the particular questionnaire was refined in the light of pupils' responses and criticisms. To avoid carrying forward initial inadequacies in the other questionnaires and as far as possible, to preserve a common format, any general suggestions accepted for the improvement of the questionnaire for one of the topics were then also applied to the questionnaires concerning the other three.

The questionnaires each went through several drafts in the process of development. The refinement of the Alcohol questionnaire only is described, since this typifies the approach used in the Smoking, Keeping Fit, and many aspects of the Diet questionnaires. Other aspects of the Diet questionnaires are dealt with additionally. Development is described under three headings:

- (i) Format;
- (ii) Language;
- (iii) Responses and scoring.

### (i) Format

Pupils said they found the following statements (ALC1: Nos. 1 to 3, 18 to 20, 22 to 24) 'long-winded' and 'confusing'. One pupil said 'I had to read them over and over again to get the meaning. I thought you were asking the same questions over and over again.'

- 1) Do you think you will drink alcoholic drinks at home with your family in the next month?  
definitely no - unlikely - not sure - quite likely - definitely yes
  - 2) Do you think you will drink alcoholic drinks in the homes of friends or relatives in the next month?  
definitely no - unlikely - not sure - quite likely - definitely yes
  - 3) Do you think you will drink alcoholic drinks with your friends in pubs or clubs in the next month?  
definitely no - unlikely - not sure - quite likely - definitely yes
- ( ... )
- 18) Would your parents think it's alright for you to drink alcoholic drinks at home with the family in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
  - 19) Would your parents think it's alright for you to drink alcoholic drinks in the homes of friends or relatives in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
  - 20) Would your parents think it's alright for you to drink alcoholic drinks with your friends in pubs or clubs in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
- ( ... )
- 22) Would your friends and other young people think it's alright for you to drink alcoholic drinks at home with your family in the next month?  
definitely no - probably no - not sure - probably yes - definitely yes
  - 23) Would your friends and other young people think it's alright for you to drink alcoholic drinks in the homes of friends or relatives in the next two weeks?  
definitely no - probably no - not sure - probably yes - definitely yes

- 24) Would your friends and other young people think it's alright for you to drink alcoholic drinks with them in pubs or clubs in the next two weeks?  
 definitely no - probably no - not sure - probably yes - definitely yes

The questions were therefore formatted in a different way, using a single stem:

During the next month, do you think you will drink alcoholic drinks:

- 1) at home with your family?  
 definitely no - unlikely - not sure - quite likely - definitely yes
- 2) at the homes of friends or relatives?  
 definitely no - unlikely - not sure - quite likely - definitely yes
- 3) with your friends in pubs or clubs?  
 definitely no - unlikely - not sure - quite likely - definitely yes

A similar approach was used with questions 18 to 20 and 22 to 25. In order to simplify the items, the time factor was removed from questions 18 to 20 and 22 to 25:

Would your friends and other young people think it's alright for you to drink alcoholic drinks:

- 22) at home with the family?  
 definitely no - probably no - not sure - probably yes - definitely yes
- 23) at the homes of friends or relatives?  
 definitely no - probably no - not sure - probably yes - definitely yes
- 24) with your friends at pubs or clubs?  
 definitely no - probably no - not sure - probably yes - definitely yes

The modified questionnaire was then piloted and as a result, the following further modifications were made: for Nos. 1 to 3, 18 to 20, 22 to 24 **bold print** and underlining were used in the 'stem' statements, to further clarify the meaning, e.g.:

**During the next month, I think I will drink alcoholic drinks:**

- 1) at home with my family?  
 definitely no - unlikely - not sure - quite likely - definitely yes
- 2) at the homes of friends or relatives?  
 definitely no - unlikely - not sure - quite likely - definitely yes

3) with your friends in pubs or clubs?

definitely no - unlikely - not sure - quite likely - definitely yes

After completing the first draft questionnaire, ALC1, pupils asked if it referred to drinking alcohol 'at ordinary times' or 'at special occasions or parties'. A note of clarification was inserted at the beginning of the questionnaire in italic print:

*You might drink alcoholic drinks on special occasions, at celebrations and parties, or even at 'ordinary times'.*

*Think about these times then try to answer the following questions as accurately as possible.*

In further piloting with Sixth Formers, this statement was criticized. They said that they generally drank alcoholic drinks at 'ordinary times' and suggested that the word 'even' be removed. This was done.

Pupils also suggested that there should be a 'break' in the questionnaire between No.3 (last Intention statement) and No.4 (first Belief statement and its Evaluation): they said that this would draw attention to the different nature of the questions and renew the interest of the respondents. The following statement was therefore inserted before No.4:

*Now here are some things which people say they believe about alcoholic drinks. What do you think?*

At the next stage in piloting, pupils complained that the items toward the end of the questionnaire (Nos. 17 to 25) merged together and their purpose was not at all clear. It was pointed out that: the Belief items ended with No. 17; Nos. 18 to 21 consisted of Normative Beliefs and Motivation to Comply with parents and Nos. 22 to 25 consisted of Normative Beliefs and Motivation to Comply with friends. They suggested that these sections be separated in order to

'break the monotony' and draw attention to the different sections. This was done by separating the sections with a row of stars.

### (ii) Language

The following changes were made to the language used in the questionnaire after the first stage of piloting:

- 9) Alcoholic drinks can seriously damage your health.

Several pupils did not understand this statement. It was changed to read:

- 9) Alcoholic drinks can damage your body, for example your brain and liver.

Some pupils criticized the following items:

- 21) Generally speaking, how much do you want to do what your parents think you should do?.

Similarly

- 25) ... what your friends and other young people think you should do?

They said that they did not know what their parents, friends and other young people *thought*. These were therefore further modified to read:

- 21) Generally speaking, how much do you want to please your parents?.

Similarly

- 25) ... how much do you want to please your friends and other young people?

Further piloting revealed problems with the word 'please'. This word was also a problem in the draft questionnaires for Smoking and Keeping Fit. Many pupils asked 'What do you mean? Please in what respect?' This item was therefore modified to read:

21) Generally speaking, how much do you want to do what your parents want you to do?

Similarly

25) ... what your friends and other young people want you to do?

These statements appeared to be satisfactory: pupils said they did know what parents and friends overtly wanted.

In the second stage of piloting, pupils found the use of 'you' and 'your' ambiguous. They occurred in many of the questions and may be interpreted as singular or plural. It was therefore decided to use the first person singular, 'I' and 'my' wherever appropriate, to avoid ambiguity and to emphasise the *personal* nature of the enquiry. At this same stage of piloting, pupils commented on the following items:

5) People should not drink and drive.  
     strongly disagree - disagree - not sure - agree - strongly agree  
     How dangerous do you think it is to drink and drive?  
     not at all dangerous - not very dangerous - not sure - quite dangerous - extremely dangerous

They insisted that it was safe to drive after drinking, if the legal limit was not exceeded. The statement modified to read:

5) I believe that people should not drive after drinking a lot of alcohol.  
     strongly disagree - disagree - not sure - agree - strongly agree  
     How much do you fear drunken drivers?  
     not at all - not very much - not sure - quite a lot - extremely

( ... )

11) Alcoholic drinks taste nice.  
     strongly disagree - disagree - not sure - agree - strongly agree  
     How important is the taste to you?  
     not at all important - not very important - not sure - quite important - extremely important

Pupils commented that not all alcoholic drinks taste nice.

It was therefore modified to read:

- 11) I think that most alcoholic drinks taste nice.  
       strongly disagree - disagree - not sure - agree - strongly agree  
       How important is to you to like the taste of drink?  
       not at all important - not very important - not sure - quite important - extremely important

( ... )

- 13) Alcoholic drinks cost a lot of money.  
       strongly disagree - disagree - not sure - agree - strongly agree  
       How wasteful is it to spend money on alcoholic drinks?  
       not at all wasteful - not very wasteful - not sure - quite wasteful - extremely wasteful

Pupils said that it depends on how well off you are: it's cheaper to go to the pub for a drink than to go to the cinema. This was therefore changed to read:

- 13) I think that alcoholic drinks cost a lot of money.  
       strongly disagree - disagree - not sure - agree - strongly agree  
       How wasteful is it to spend money on alcoholic drinks?  
       not at all wasteful - not very wasteful - not sure - quite wasteful - extremely wasteful

Also at this second stage some of the younger pupils did not understand several of the Evaluation of Belief statements, e.g.:

- 4) Alcoholic drinks calm your nerves and help you to relax.  
       don't know - perhaps - fairly sure - certain  
       How important is it to be calm and relaxed?  
       not at all important - not very important - not sure - quite important - extremely important

After discussion with the pupils, it was agreed that the Evaluation would be clarified as follows:

- 4) Alcoholic drinks calm my nerves and help me to relax.  
       strongly disagree - disagree - not sure - agree - strongly agree  
       How much do you want to be calm and relaxed?  
       not at all - not very much - not sure - quite a lot - extremely

Similar changes were made to Nos. 7, 12 and 16.

### **(iii) Responses and scoring**

#### ***Intention scales***

Ajzen and Fishbein (1975 and 1980) suggest that Intentions are scored on bi-polar scales. This approach seems satisfactory when using one Intention statement only:



e.g. 'Do you intend to vote in the presidential election?'  
 very unlikely ----- very likely  
 -3 or -2                      0                      +2 or +3

Piloting showed that this was not a sound approach when more than one 'Intention' statement is used:

**During the next month, I think I will drink alcoholic drinks:**

- 1) at home with your family?  
 definitely no - unlikely - not sure - quite likely - **definitely yes**  
 -2                      -1                      0                      +1                      +2
- 2) at the homes of friends or relatives?  
 definitely no - unlikely - **not sure** - quite likely - definitely yes  
 -2                      -1                      0                      +1                      +2
- 3) with your friends in pubs or clubs?  
**definitely no** - unlikely - not sure - quite likely - definitely yes  
 -2                      -1                      0                      +1                      +2

Consider the response circled. In this context a negative response for No. 3 will cancel a positive response in No. 1, the score for 'Intention to drink alcohol will be 0 (ie. -2 +2). This does not reflect the true situation, where there is an intention to drink alcohol 'at home with the family'. Thus degrees of negativity are meaningless in this context. It was therefore decided to score Intentions from 0 to +3. eg.

**During the next month or so, I think I will drink alcoholic drinks:**

- 1) at home with my family,  
 definitely no - perhaps - quite likely - definitely yes  
 0                      +1                      +2                      +3
- 2) at the homes of friends or relatives,  
 definitely no - perhaps - quite likely - definitely yes  
 0                      +1                      +2                      +3
- 3) with my friends in pubs or clubs.  
 definitely no - perhaps - quite likely - definitely yes  
 0                      +1                      +2                      +3

Similarly normative beliefs were scored 0 to +3 (see Normative Beliefs and Motivation to comply below).

**Strength of Belief and Outcome Evaluation**

In the first draft (ALC1), the strength of belief and the outcome evaluation were both investigated using 5 point, bi-polar scales, as follows:

5) People should not drink and drive.

strongly disagree - disagree - not sure - agree - strongly agree

-2 -1 0 +1 +2

How dangerous do you think it is to drink and drive?

not at all dangerous - not very dangerous - not sure - quite dangerous - extremely dangerous

+2 +1 0 -1 -2

This use of two bi-polar scales in any one item inevitably produces anomalous results: the product score ( $b \times e$ ) of totally opposite views is the same ( $-2 \times -2 = 4$  and  $+2 \times +2 = 4$ ). Other anomalies were also revealed, e.g.: one boy responded 'disagree' (-1). In a discussion later he explained his choice. He said that his father drives his car after drinking and insisted that "you have no choice if you go to a party because you have to have a few drinks, nobody drinks orange juice all night." Furthermore, he said that his father had never been involved in a road accident. Other boys in the group tended to agree with this point of view that "some people could drink and drive quite safely". When the first boy was asked, however; 'How dangerous do you think it is to drink and drive?' he responded 'extremely dangerous' (-2), on the grounds that for most people it was very dangerous (but not for his father).

Thus the product of his responses, with respect to drinking and driving was  $(-1 \times -2)$ , +2 (i.e. positive), which is not a true reflection of his attitude towards drinking and driving which he considered to be extremely dangerous. This sort of anomaly occurred also in the other questionnaires. In the light of this piloting, it was

decided to measure strength of beliefs on a 0 to +3 scale. This would give a product range (b x e) of -6 to +6 and will serve to eliminate inconsistent responses.

For the next draft, then, the following 0 to +3 scale for strength of belief was adopted:

5) People should not drink and drive.

don't know - perhaps - fairly sure - certain

0 +1 +2 +3

How dangerous do you think it is to drink and drive?

not at all dangerous - not very dangerous - not sure - quite dangerous - extremely dangerous

+2 +1 0 -1 -2

Since the statement 'You should not drink and drive' was a salient belief, elicited from the target population, one would expect the majority of the population to agree with it to some degree. If they did not agree, they would be expected to choose the 'not at all certain' response, (score=0), their score for that particular belief and its evaluation would then be 0. This method of scoring would help to counteract any inconsistencies in young peoples' responses. For example, a score of 0 (0 x -2) would correctly reflect the attitudes of the said boy, with respect to drinking and driving, because his responses to the questionnaire had been inconsistent.

At the next stage of piloting however, pupils strongly disapproved of the mono-polar 'strength of belief' responses: they wanted to disagree with some of the statements. (Similar comments were made by many of the pupils completing the draft questionnaires with respect to Smoking and Keeping Fit). In the light of these objections a 5 point, bi-polar scale (strongly disagree to strongly agree) was re-introduced, and where necessary, statements

were re-phrased.

In order to avoid the conjunction of two bi-polar scales, it therefore became necessary to use a uni-polar scale to measure outcome evaluations. There are precedents in the literature for this procedure. Most recently, Marsh and Matheson (1983 p.4) investigating smoking attitudes and behaviour have adopted this approach. They state that 'the evaluation part was measured by ... how much smokers 'wanted' or 'feared' each outcome. They scored this as follows (p.175):

'How much do you want your breath to smell nice?'

'I want very much'	+4
'Quite a lot'	+3
'A fair amount'	+2
'Just a little'	+1
'I don't care about it'	0

and (p.176):

'How much do you fear becoming short of breath?'

'Very much indeed'	-4
'Quite a lot'	-3
'A fair amount'	-2
'Just a little'	-1
'I don't care about it'	0

A similar approach to this was adopted in the present study, since it was entirely unreasonable to attempt to evaluate most outcomes on a bi-polar scale (very bad -2 to very good +2). No sane individual could possibly be expected to evaluate any truly negative outcome, such as 'Drinking a lot makes me sick and ill' as being in any degree good. The following approach was therefore used:

16) Drinking helps me to be sociable with people.

strongly disagree - disagree - not sure - agree - strongly agree

-2                      -1                      0                      +1                      +2

How much do you want to be sociable?

not at all - not very much - quite a lot - extremely

0                      +1                      +2                      +3

17) Drinking a lot makes me sick and ill.  
 strongly disagree - disagree - not sure - agree - strongly agree  
 -2 -1 0 +1 +2  
 How worried are you about feeling sick and ill?  
 not at all worried - not very worried - quite worried - extremely worried  
 0 -1 -2 -3

The direction of the scoring was determined by what the target population had identified as advantages (positive outcomes) or disadvantages (negative outcomes) of particular behaviours. A 0 to + or - 3 scale was used, since it was considered that a 0 to + or - 4 scale, as used by Marsh and Matheson with adults, would be too finely calibrated for use with secondary school pupils.

**Normative Beliefs and motivation to comply.**

Fishbein and Ajzen (1975 p.309) suggest the following approach to the scoring of Normative Beliefs and Motivation to Comply:

My mother thinks  
I should (+3)----- 0 ----- (-3) should not  
use the birth control pill

In general  
I want to (+3) ----- 0 ----- (-3) I want *not* to  
do what my mother thinks I should do

i.e. the inevitably anomalous use of 2 bi-polar scales..

A number of workers have followed this approach, for example, Bearden and Woodside (1978) investigating attitude models as predictors of marijuana intentions and reported behaviour, states: 'evaluation ( $e_1$ ) and motivation to comply ( $m_1$ ) statements were operationalized by a 7 point scale, ranging from 'bad' to 'good'. All belief, evaluation and motivation to comply statements were scored -3 to +3.'

**a) Normative Beliefs**

Initially Normative Beliefs were scored, as suggested in the literature, on a bi-polar scale -2 to +2 mimicing the Intention scales. This scoring produced the same anomalies as encountered with the Intention scales. Changing to the method adopted for scoring those scales, Normative Beliefs were finally scored as follows:

**Would your parents think it's alright for you to drink alcoholic drinks:**

- 18) at home with the family?  
       definitely no - perhaps - quite likely - definitely yes  
           0               +1               +2               +3
- 19) at the homes of friends or relatives?  
       definitely no - perhaps - quite likely - definitely yes  
           0               +1               +2               +3
- 20) with your friends in pubs or clubs?  
       definitely no - perhaps - quite likely - definitely yes  
           0               +1               +2               +3

**b) Motivation to Comply**

Initially Motivation to Comply was scored as follows:

- 21) Generally speaking, how much do you want to do what your parents want you to do?  
       not at all - not very much - not sure - quite a lot - extremely  
           -2               -1               0               +1               +2

In piloting, this method of scoring was found to be unsatisfactory. If a pupil responds 'not at all', the score would be -2, the negative sign suggesting that he or she will do the *opposite* to what he believes his parents want him to do. Ajzen and Fishbein (1980 p.75) point out that 'people are unlikely to be motivated to do the opposite of what their salient referents think they should do' and in this later publication suggest the use of a uni-polar scale, e.g.:

- 'In general, how much do you want to do what your husband thinks you should do?'
- |            |          |            |          |
|------------|----------|------------|----------|
| not at all | Slightly | moderately | strongly |
| 0          | +1       | +2         | +3       |

Furthermore, Ajzen and Fishbein (1980, p.236), with remarkable lack of consistency, suggest that Motivation to Comply scale should be scored from +1 (not at all) to +7 (very much) i.e. a uni-polar scale.

In the present study uni-polar scales were used to score Motivation to Comply as follows:

21) Generally speaking, how much do you want to do what your parents want you to do?

not at all - not very much - quite a lot - extremely			
0	+1	+2	+3

The 0 to +3 scale complies with Ajzen and Fishbein's (1980 p.75) suggestion and conforms with the scoring of Outcome Evaluations in this present study. Examination of the literature indicates that a number of researchers have adopted a similar uni-polar scale to measure motivation to comply with a particular salient referent, for example Loken and Fishbein (1980 p. 20). However, difficulties have been reported. Schlegel, Crawford and Sanborn (1977) state that 'inclusion of motivation to comply' in the model consistently *reduced* prediction of behavioural intentions, regardless of coding format (-3 to +3 or 1 to +7)!

### **Piloting of the Diet Questionnaire**

Since it has a slightly different format, some aspects of the piloting of the Diet questionnaire are now dealt with separately.

Pupils complained that the Outcome Evaluations for items 25, 27, 31 and 33 were very similar, viz:

- 25) Fresh fruit is not fattening.  
       strongly disagree - disagree - not sure - agree - strongly agree  
 How much do you worry about getting fat?  
       not at all - not very much - not sure - quite a lot - extremely
- 27) Greens and salads are good for slimmers.  
       strongly disagree - disagree - not sure - agree - strongly agree  
 How much do you want to slim?  
       not at all - not very much - not sure - quite a lot - extremely
- 31) Sweet things and sugar are very fattening.  
       strongly disagree - disagree - not sure - agree - strongly agree  
 How much do you worry about getting fat?  
       not at all - not very much - not sure - quite a lot - extremely
- 33) Eating fatty foods can make me overweight.  
       strongly disagree - disagree - not sure - agree - strongly agree  
 How much do you worry about being overweight?  
       not at all - not very much - not sure - quite a lot - extremely

Salient beliefs about certain foods having high or low calorie content were therefore grouped together, delineated between two rows of stars, in future drafts and two outcome evaluations only were included, viz:

\* \* \* \* \*

- 21) Fresh fruit is not fattening.  
       strongly disagree - disagree - not sure - agree - strongly agree
- 22) Greens and salads are good for slimmers.  
       strongly disagree - disagree - not sure - agree - strongly agree
- How much do you want to be slim?  
       not at all - not very much - not sure - quite a lot - extremely
- 23) Sweet things and sugar are very fattening.  
       strongly disagree - disagree - not sure - agree - strongly agree
- 24) Eating fatty foods can make me overweight.  
       strongly disagree - disagree - not sure - agree - strongly agree
- How much do you worry about being overweight?  
       not at all - not very much - not sure - quite a lot - extremely

\* \* \* \* \*

Pupils complained about what they saw as the similar and tedious nature of items 24, 26 and 35 so in future drafts these items also were grouped together, using only one Outcome Evaluation and delineated by rows of stars:



\* \* \* \* \*

25) Fresh fruit is good for me and keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree

26) Milk is good for me and keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree

27) Greens and salads are good for me and keep me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree

How important is it to you to keep healthy?  
not at all important - not very important - quite important - extremely important

\* \* \* \* \*

Initially, for Diet, the Normative Beliefs and Motivation to Comply were investigated by two questions, as follows:

36) Do your **parents** try to persuade you to eat certain kinds of food?  
definitely no - unlikely - not sure - quite likely - definitely yes

37) How much do you want to do what your **parents** want you to do?  
not at all - not very much - not sure - quite a lot - extremely

Subsequently it was decided to investigate Normative Beliefs concerning Diet in a way similar to that used in the other questionnaires, i.e. a Normative Belief 'stem' preceded the Intention statement, even though the pupils had complained that this form was tedious.

Two 'stems' were piloted:

Do your parents *think you should* eat the following things in the next few days?

Do your parents *expect you to* eat the following things in the next few days?

Six third year pupils were involved in this pilot study. They completed both versions of the questionnaire and in discussion afterwards said they responded differently to each. They were asked what they understood by each version. They said 'what your parents *think you should eat*' means:

- 'What your parents want, you might not do it';
- 'This is from your parents point of view';
- 'This is what your parents try to make you eat'.

They said 'what your parents expect you to eat' means:

- 'Parents expect you to do what you normally do';
- 'Its your point of view';
- 'What you are doing';
- 'They would expect you to eat it because you do eat it';
- 'This would show how parents pressure got through in what we actually eat';
- 'It means what you are doing with parents agreement';

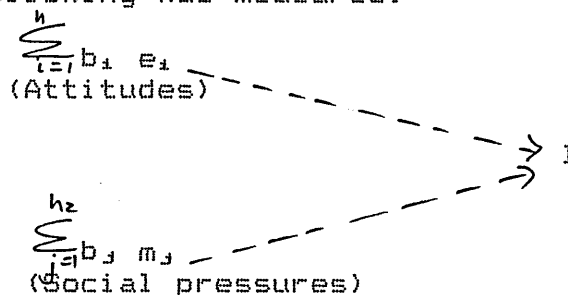
Pupils said that they would answer the latter version in the same way as they answered the 'Intention' scale. Thus 'Do your parents think you *should* eat the following things' would give a better measure of parental social pressures on adolescents to eat certain types of food. This version was therefore used in the final questionnaire:

Do your **parents** think you should eat the following things in the next few days:

- 36) Some **protein** (e.g. meat, fish, cheese, eggs, beans);  
definitely no - perhaps - quite likely - definitely yes
- 37) Some **brown wholemeal bread, bran or wholemeal cereal like muesli**;  
definitely no - perhaps - quite likely - definitely yes
- 38) Extra **salt** put on your food at the table;  
definitely no - perhaps - quite likely - definitely yes
- 39) Some **salad**;  
definitely no - perhaps - quite likely - definitely yes
- 40) Quite a lot of **sugar** (e.g. in tea or coffee, on cereals, in cakes, biscuits or puddings etc.);  
definitely no - perhaps - quite likely - definitely yes
- 41) Some **fresh fruit**;  
definitely no - perhaps - quite likely - definitely yes
- 42) Quite a lot of **crisps** or similar snacks;  
definitely no - perhaps - quite likely - definitely yes

- 43) Some **fresh green vegetables**;  
definitely no - perhaps - quite likely - definitely yes
- 44) Quite a lot of **fried foods** like chips, sausages,  
beef burgers, bacon etc.;  
definitely no - perhaps - quite likely - definitely yes
- 45) Quite a lot of **milk**, on its own and in other drinks (such  
as milk shakes, tea, coffee, drinking chocolate, etc.);  
definitely no - perhaps - quite likely - definitely yes
- 46) Quite a lot of **"sweets" or sweet snacks**;  
definitely no - perhaps - quite likely - definitely yes
- 47) How much do you want to do what your **parents** want you  
to do?  
not at all - not very much - quite a lot - extremely

The decision to measure Normative Beliefs with respect to each kind of food separately was made in consideration of how the data from the questionnaire would be analysed. Returning to the Ajzen and Fishbein model, in the present study the following was measured:



Where

- $b_i$  is the belief that performing a particular behaviour leads to consequences or outcomes  $i$ ;
- $e_i$  is the person's evaluation of outcome  $i$ ;
- $n_1$  is the number of salient beliefs the person holds about performing that particular behaviour;
- $b_j$  is the normative belief i.e. the person's belief that a reference group or individual  $j$  thinks that he should or should not perform a particular behaviour;
- $m_j$  is the motivation to comply with the referent  $j$ ;
- $n_2$  is the number of relevant referents;
- $I$  is the Intention to perform that particular behaviour.

It was intended to use regression analysis to establish the relative importance of Attitudes and Social pressures in determining Intentions towards Diet. On examination, however, it was evident that the items in each of these scales were not additive: it would make no sense to attempt to add up Intentions or Attitudes about eleven totally different kinds of food. Clearly these foods must be treated as separate entities, hence the Normative Belief for each kind of food must also be measured separately in order that the relative importance of Attitudes and Social pressures can be established in relation to the Intention to eat a particular food.

Other aspects of the Diet, the Smoking and Keeping Fit questionnaires were piloted in a way similar to that described for Alcohol. The title and instruction page (see Appendix 03) was used when piloting the draft questionnaires on the four topics. Pupils' comments were noted and modifications were made to it as described below. Even though no provision had been made on this page for the pupil's name, many asked, 'Do we have to put our names on it?' A sentence was therefore inserted as follows:

'We are not asking you to put your name on this questionnaire, so nobody will know how you have answered.'

The following item caused problems:

Your age:                      years                      months.      Your form:                     

Some pupils were unable to calculate the 'months', others thought that 'years' meant 'date of birth'. Furthermore it was intended to analyse the data in terms of Lower School

(1st. and 2nd. Years), Middle School (3rd. and 4th. Years) and Upper School (5th., 6th. and 7th. Years), since this reflected pupils' maturity within the school system better than their actual chronological ages. The whole of the above item was therefore omitted and pupils were merely asked to state their Year Group.

It was proposed also to analyse the data by sex. In the final draft therefore, pupils were asked to state if they were a boy or a girl.

The responses to the 'practice questions' were changed to conform with those of the questionnaires.

A copy of the final version of the title page is given in Appendix 06.

*You might drink alcoholic drinks on special occasions, at celebrations and parties, or at 'ordinary times'. Think about these times then try to answer the following questions as accurately as possible.*

For office Use.

During the next month or so, I think I will drink alcoholic drinks:

- |   |                   |
|---|-------------------|
| 1) at home with my family,<br>definitely no - perhaps - quite likely - definitely yes               | .....9<br>.....10 |
| 2) at the homes of friends or relatives,<br>definitely no - perhaps - quite likely - definitely yes | .....11           |
| 3) with my friends in pubs or clubs.<br>definitely no - perhaps - quite likely - definitely yes     | .....12           |

*Now here are some things which people say they believe about alcoholic drinks. What do you think?*

- |  |            |
|--|------------|
| 4) Alcoholic drinks calm my nerves and help me to relax.<br>strongly disagree - disagree - not sure - agree - strongly agree                               | .....13-14 |
| How much do you want to be calm and relaxed?<br>not at all - not very much - quite a lot - extremely   | .....15    |
| 5) I believe that people should not drive after drinking a lot of alcohol.<br>strongly disagree - disagree - not sure - agree - strongly agree             | .....16-17 |
| How much do you fear drunken drivers?<br>not at all - not very much - quite a lot - extremely  | .....18    |
| 6) If you drink a lot, you can find it hard to stop and you could become an alcoholic.<br>strongly disagree - disagree - not sure - agree - strongly agree | .....19-20 |
| How serious is it if you become an alcoholic?<br>not at all serious - not very serious - quite serious - extremely serious                                 | .....21    |
| 7) Alcoholic drinks make me feel cheerful.<br>strongly disagree - disagree - not sure - agree - strongly agree   | .....22-23 |
| How much do you want to feel cheerful?<br>not at all - not very much - quite a lot - extremely   | .....24    |

- 8) Alcoholic drinks make me feel confident and sure of myself.  
strongly disagree - disagree - not sure - agree - strongly agree .....25-26
- How important is it to you to feel confident?  
not at all important - not very important - quite important - extremely important .....27
- 9) Alcoholic drinks could seriously damage my body, for example, my brain and liver.  
strongly disagree - disagree - not sure - agree - strongly agree .....28-29
- How worried are you about damaging your health?  
not at all worried - not very worried - quite worried - extremely worried .....30
- 10) You can get aggressive and get into fights when you drink.  
strongly disagree - disagree - not sure - agree - strongly agree .....31-32
- How serious is it if you get into fights?  
not at all serious - not very serious - quite serious - extremely serious .....33
- 11) I think that most alcoholic drinks taste nice.  
strongly disagree - disagree - not sure - agree - strongly agree .....34-35
- How important is to you to like the taste of a drink?  
not at all important - not very important - quite important - extremely important .....36
- 12) Drinking makes me feel 'grown up'.  
strongly disagree - disagree - not sure - agree - strongly agree .....37-38
- How much do you want to feel grown up?  
not at all - not very much - quite a lot - extremely .....39
- 13) I think that alcoholic drinks cost a lot of money.  
strongly disagree - disagree - not sure - agree - strongly agree .....40-41
- How wasteful is it to spend money on alcoholic drinks?  
not at all wasteful - not very wasteful - quite wasteful - extremely wasteful .....42
- 14) I could get a hangover after drinking a lot.  
strongly disagree - disagree - not sure - agree - strongly agree .....43-44
- How miserable do you think it is to have a hangover?  
not at all miserable - not very miserable - quite miserable - extremely miserable .....45
- 15) Drinking makes me say and do things I don't mean.  
strongly disagree - disagree - not sure - agree - strongly agree .....46-47
- How worried are you about saying and doing things you don't mean?  
not at all worried - not very worried - quite worried - extremely worried .....48

16) Drinking helps me to be sociable with people.  
strongly disagree - disagree - not sure - agree - strongly agree .....49-50

How much do you want to be sociable?  
not at all - not very much - quite a lot - extremely .....51

17) Drinking a lot makes me sick and ill.  
strongly disagree - disagree - not sure - agree - strongly agree .....52-53

How worried are you about feeling sick and ill?  
not at all worried - not very worried - quite worried - extremely worried .....54

\* \* \* \* \*

Would your parents think it's alright for you to drink alcoholic drinks:

18) at home with the family?  
definitely no - perhaps - quite likely - definitely yes .....55

19) at the homes of friends or relatives?  
definitely no - perhaps - quite likely - definitely yes .....56

20) with your friends in pubs or clubs?  
definitely no - perhaps - quite likely - definitely yes .....57

21) Generally speaking, how much do you want to do what your parents want you to do?  
not at all - not very much - quite a lot - extremely .....58

\* \* \* \* \*

Would your friends and other young people think it's alright for you to drink alcoholic drinks:

22) at home with the family?  
definitely no - perhaps - quite likely - definitely yes .....59

23) at the homes of friends or relatives?  
definitely no - perhaps - quite likely - definitely yes .....60

24) with your friends in pubs or clubs?  
definitely no - perhaps - quite likely - definitely yes .....61

25) Generally speaking, how much do you want to do what your friends and other young people want you to do?  
not at all - not very much - quite a lot - extremely .....62

NOW PLEASE CHECK THAT YOU HAVE PUT A CIRCLE ROUND 39 WORDS  
ON THIS PINK QUESTIONNAIRE.



For Office Use.

During the next month, I think I will smoke cigarettes:

.....9

- 1) when I am alone,  
definitely no - perhaps - quite likely - definitely yes .....10
- 2) when I am with friends,  
definitely no - perhaps - quite likely - definitely yes .....11
- 3) at a party or disco.  
definitely no - perhaps - quite likely - definitely yes .....12

*Here are some things which people say they believe about  
smoking cigarettes. What do you think?*

- 4) Smoking calms my nerves and helps me to relax.  
strongly disagree - disagree - not sure - agree - strongly agree .....13-14

Generally speaking how important is it to you  
to be calm and relaxed?

not at all important - not very important - quite important - extremely important .....15

- 5) Smoking can cause serious illnesses,  
like lung cancer and heart attacks.  
strongly disagree - disagree - not sure - agree - strongly agree .....16-17

How much do you fear these illnesses?

not at all - not very much - quite a lot - extremely .....18

- 6) You can get addicted to smoking cigarettes  
and find it hard to give up.  
strongly disagree - disagree - not sure - agree - strongly agree .....19-20

How serious do you think it would be  
if you became addicted?

not at all serious - not very serious - quite serious - extremely serious .....21

- 7) Smoking helps me to be sociable and join in  
with a group of friends.  
strongly disagree - disagree - not sure - agree - strongly agree .....22-23

Generally speaking, how important is it to you  
to be sociable?

not at all important - not very important - quite important - extremely important .....24

- 8) Smoking would stain my teeth and fingers.  
strongly disagree - disagree - not sure - agree - strongly agree .....25-26
- How much do you care about staining your teeth and fingers?  
not at all - not very much - quite a lot - extremely .....27
- 9) Other people's cigarette smoke can give me lung cancer.  
strongly disagree - disagree - not sure - agree - strongly agree .....28-29
- How much do you worry about the effects of other people's smoke on your health?  
not at all - not very much - quite a lot - extremely .....30
- 10) Cigarettes cost a lot of money.  
strongly disagree - disagree - not sure - agree - strongly agree .....31-32
- How wasteful do you think it is to spend money on cigarettes?  
not at all wasteful - not very wasteful - quite wasteful - extremely wasteful .....33
- 11) Cigarette smoke makes your breath, clothes, hair etc., smell.  
strongly disagree - disagree - not sure - agree - strongly agree .....34-35
- How unpleasant do you think it is to smell of cigarette smoke?  
not at all unpleasant - not very unpleasant - quite unpleasant - extremely unpleasant .....36
- 12) Young people smoke to look 'grown-up'.  
strongly disagree - disagree - not sure - agree - strongly agree .....37-38
- Generally speaking, how important is it to you to feel 'grown up'?  
not at all important - not very important - quite important - extremely important .....39

\* \* \* \* \*

My parents think it's alright for me to smoke cigarettes:

- 13) when I am on my own,  
definitely no - perhaps - quite likely - definitely yes .....40
- 14) when I am with friends,  
definitely no - perhaps - quite likely - definitely yes .....41
- 15) at a party or disco.  
definitely no - perhaps - quite likely - definitely yes .....42
- 16) Generally speaking, how much do you want to do what your parents want you to do?  
not at all - not very much - quite a lot - extremely .....43

\* \* \* \* \*

Friends and other young people think it's alright  
for me to smoke cigarettes:

- 17) when I am on my own,  
definitely no - perhaps - quite likely - definitely yes .....44
- 18) when I am with friends,  
definitely no - perhaps - quite likely - definitely yes .....45
- 19) at a party or disco.  
definitely no - perhaps - quite likely - definitely yes .....46
- 20) Generally speaking, how much do you want to do what  
your friends and other young people want you to do?  
not at all - not very much - quite a lot - extremely .....47

NOW PLEASE CHECK THAT YOU HAVE PUT A CIRCLE ROUND 29 WORDS  
ON THIS BLUE QUESTIONNAIRE.

For Office Use.

In the next week or so I think I will:

- .....9
- 1) do physical exercises which I can do alone,  
like jogging, aerobics, swimming,  
bicycle-riding, walking, etc.  
definitely no - perhaps - quite likely - definitely yes .....10
- 2) take part in sports with other people outside school,  
such as squash, badminton, football, tennis, hockey  
definitely no - perhaps - quite likely - definitely yes .....11
- 3) avoid spending a lot of time just sitting around.  
definitely no - perhaps - quite likely - definitely yes .....12

*Now here are some things which people say they believe about  
keeping fit. What do you think?*

- 4) Exercising keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree .....13-14
- How important is it to you to keep healthy?  
not at all important - not very important - quite important - extremely important .....15
- 5) Keeping fit gives me aches and pains in my muscles  
the next day.  
strongly disagree - disagree - not sure - agree - strongly agree .....16-17
- How much do you worry about having aches and pains?  
not at all - not very much - quite a lot - extremely .....18
- 6) Taking exercise keeps me fit and in good  
physical shape.  
strongly disagree - disagree - not sure - agree - strongly agree .....19-20
- How important is it to you to keep in good shape?  
not at all important - not very important - quite important - extremely important .....21
- 7) I find taking exercise exhausting and tiring.  
strongly disagree - disagree - not sure - agree - strongly agree .....22-23
- How unpleasant is it to you to be exhausted and tired?  
not at all unpleasant - not very unpleasant - quite unpleasant - extremely unpleasant .....24
- 8) Keeping fit makes me feel good afterwards.  
strongly disagree - disagree - not sure - agree - strongly agree .....25-26
- How important is it to you to feel good in this way?  
not at all important - not very important - quite important - extremely important .....27
- 9) I find exercising enjoyable and good fun at the time.  
strongly disagree - disagree - not sure - agree - strongly agree .....28-29
- How important is it to you to have fun in this way?  
not at all important - not very important - quite important - extremely important .....30

- 10) Sporting activities are sociable and help me to meet people.  
 strongly disagree - disagree - not sure - agree - strongly agree .....31-32
- How pleasant do you think it is to be sociable?  
 not at all pleasant - not very pleasant - quite pleasant - extremely pleasant .....33
- 11) I could get injured and hurt myself doing sport.  
 strongly disagree - disagree - not sure - agree - strongly agree .....34-35
- How much do you fear getting injured or hurting yourself?  
 not at all - not very much - quite a lot - extremely .....36

\* \* \* \* \*

My parents think that I should:

- 12) do physical exercises which I can do alone,  
 like jogging, aerobics, swimming,  
 bicycle-riding, walking, etc.;  
 definitely no - perhaps - quite likely - definitely yes .....37
- 13) take part in sports with other people outside school  
 like, squash, badminton, football, tennis, hockey;  
 definitely no - perhaps - quite likely - definitely yes .....38
- 14) avoid spending a lot of time just sitting around.  
 definitely no - perhaps - quite likely - definitely yes .....39
- 15) Generally speaking, how much do you want to do  
 what your parents want you to do?  
 not at all - not very much - quite a lot - extremely .....40

\* \* \* \* \*

My friends think that I should:

- 16) do physical exercises which I can do alone,  
 like jogging, aerobics, swimming,  
 bicycle-riding, walking, etc.;  
 definitely no - perhaps - quite likely - definitely yes .....41
- 17) take part in sports with other people outside school  
 like, squash, badminton, football, tennis, hockey;  
 definitely no - perhaps - quite likely - definitely yes .....42
- 18) avoid spending a lot of time just sitting around.  
 definitely no - perhaps - quite likely - definitely yes .....43
- 19) Generally speaking, how much do you want to do  
 what your friends want you to do?  
 not at all - not very much - quite a lot - extremely .....44

NOW PLEASE CHECK THAT YOU HAVE PUT A CIRCLE ROUND 27 WORDS  
 ON THIS GREEN QUESTIONNAIRE.

For Office Use.

In the next few days I think I will eat:

.....9

- 1) Some protein (e.g. meat, fish, cheese, eggs, beans);  
definitely no - perhaps - quite likely - definitely yes .....10
- 2) Some brown wholemeal bread, bran or wholemeal cereal  
like muesli;  
definitely no - perhaps - quite likely - definitely yes .....11
- 3) Extra salt put on my food at the table;  
definitely no - perhaps - quite likely - definitely yes .....12
- 4) Some salad;  
definitely no - perhaps - quite likely - definitely yes .....13
- 5) Quite a lot of sugar (e.g. in tea or coffee,  
on cereals, in cakes, biscuits or puddings etc.);  
definitely no - perhaps - quite likely - definitely yes .....14
- 6) Some fresh fruit;  
definitely no - perhaps - quite likely - definitely yes .....15
- 7) Quite a lot of crisps or similar snacks;  
definitely no - perhaps - quite likely - definitely yes .....16
- 8) Some fresh green vegetables;  
definitely no - perhaps - quite likely - definitely yes .....17
- 9) Quite a lot of fried foods like chips, sausages,  
beef burgers, bacon etc.;  
definitely no - perhaps - quite likely - definitely yes .....18
- 10) Quite a lot of milk, on its own and in other  
drinks (such as milk shakes, tea, coffee,  
drinking chocolate, etc.);  
definitely no - perhaps - quite likely - definitely yes .....19
- 11) Quite a lot of "sweets" or sweet snacks.  
definitely no - perhaps - quite likely - definitely yes .....20

\* \* \* \* \*

What do you think of the taste of the following foods?

- 12) Green vegetables;  
horrible - not very nice - not sure - quite nice - extremely nice .....21-22
- 13) Foods like chips, sausages, beef burgers, pies etc.;  
horrible - not very nice - not sure - quite nice - extremely nice .....23-24
- 14) Salads;  
horrible - not very nice - not sure - quite nice - extremely nice .....25-26
- 15) Brown wholemeal bread, bran or wholemeal cereal  
like muesli;  
horrible - not very nice - not sure - quite nice - extremely nice .....27-28

- 16) "Sweets" and sweet food;  
horrible - not very nice - not sure - quite nice - extremely nice .....29-30
- 17) Salt;  
horrible - not very nice - not sure - quite nice - extremely nice .....31-32
- 18) Most fresh fruit;  
horrible - not very nice - not sure - quite nice - extremely nice .....33-34
- 19) Protein (e.g. meat, fish, cheese, eggs, beans);  
horrible - not very nice - not sure - quite nice - extremely nice .....35-36
- 20) Milk;  
horrible - not very nice - not sure - quite nice - extremely nice .....37-38
- 21) Most crisps and similar snacks.  
horrible - not very nice - not sure - quite nice - extremely nice .....39-40

How important is it to you to eat food that  
you like the taste of?  
not at all important - not very important - quite important - extremely important .....41

\* \* \* \* \*

- 22) Fresh fruit is not fattening.  
strongly disagree - disagree - not sure - agree - strongly agree .....42-43
- 23) Greens and salads are good for slimmers.  
strongly disagree - disagree - not sure - agree - strongly agree .....44-45

How much do you want to become slim or remain slim?  
not at all - not very much - quite a lot - extremely .....46

- 24) Sweet things and sugar are very fattening.  
strongly disagree - disagree - not sure - agree - strongly agree .....47-48
- 25) Eating fatty foods can make me overweight.  
strongly disagree - disagree - not sure - agree - strongly agree .....49-50

How much do you worry about being overweight?  
not at all - not very much - quite a lot - extremely .....51

\* \* \* \* \*

- 26) Fresh fruit is good for me and keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree .....52-53
- 27) Milk is good for me and keeps me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree .....54-55

- 28) Greens and salads are good for me and keep me healthy.  
strongly disagree - disagree - not sure - agree - strongly agree .....56-57
- How important is it to you to keep healthy?  
not at all important - not very important - quite important - extremely important .....58
- \* \* \* \* \*
- 29) I need protein foods (e.g. meat, fish, cheese, eggs, beans) in order to grow and to repair my body.  
strongly disagree - disagree - not sure - agree - strongly agree .....59-60
- How important is it to you to grow and repair your body?  
not at all important - not very important - quite important - extremely important .....61
- 30) I think that protein foods are filling.  
strongly disagree - disagree - not sure - agree - strongly agree .....62-63
- How much do you want to eat foods that are filling?  
not at all - not very much - quite a lot - extremely .....64
- 31) I find brown bread and bran dry and hard to swallow.  
strongly disagree - disagree - not sure - agree - strongly agree .....65-66
- How disagreeable is it to you if your food is hard to swallow?  
not at all disagreeable - not very disagreeable - quite disagreeable - extremely disagreeable .....67
- 32) Brown bread and bran help my digestive system.  
strongly disagree - disagree - not sure - agree - strongly agree .....68-69
- How much do you think you need to help your digestive system?  
not at all - not very much - quite a lot - extremely .....70
- 33) Eating sweet things and sugar rots my teeth.  
strongly disagree - disagree - not sure - agree - strongly agree .....71-72
- How much do you worry about tooth decay?  
not at all - not very much - quite a lot - extremely .....73
- 34) Eating too much fatty food like sausages, chips, hamburgers, bacon, pastries etc., could cause me to have a heart attack when I get older.  
strongly disagree - disagree - not sure - agree - strongly agree .....74-75
- How much do you fear a heart attack?  
not at all - not very much - quite a lot - extremely .....76



- 35) A lot of salt is bad for my health.  
strongly disagree - disagree - not sure - agree - strongly agree .....77-78
- How much do you worry about your health?  
not at all - not very much - quite a lot - extremely .....79
- \* \* \* \* \*
- Do your parents think you should eat the following things in the next few days:
- 36) Some protein (e.g. meat, fish, cheese, eggs, beans);  
definitely no - perhaps - quite likely - definitely yes .....1
- 37) Some brown wholemeal bread, bran or wholemeal cereal like muesli;  
definitely no - perhaps - quite likely - definitely yes .....2
- 38) Extra salt put on your food at the table;  
definitely no - perhaps - quite likely - definitely yes .....3
- 39) Some salad;  
definitely no - perhaps - quite likely - definitely yes .....4
- 40) Quite a lot of sugar (e.g. in tea or coffee, on cereals, in cakes, biscuits or puddings etc.);  
definitely no - perhaps - quite likely - definitely yes .....5
- 41) Some fresh fruit;  
definitely no - perhaps - quite likely - definitely yes .....6
- 42) Quite a lot of crisps or similar snacks;  
definitely no - perhaps - quite likely - definitely yes .....7
- 43) Some fresh green vegetables;  
definitely no - perhaps - quite likely - definitely yes .....8
- 44) Quite a lot of fried foods like chips, sausages, beef burgers, bacon etc.;  
definitely no - perhaps - quite likely - definitely yes .....9
- 45) Quite a lot of milk, on its own and in other drinks (such as milk shakes, tea, coffee, drinking chocolate, etc.);  
definitely no - perhaps - quite likely - definitely yes .....10
- 46) Quite a lot of "sweets" or sweet snacks;  
definitely no - perhaps - quite likely - definitely yes .....11
- 47) How much do you want to do what your parents want you to do?  
not at all - not very much - quite a lot - extremely .....12

NOW PLEASE CHECK THAT YOU HAVE PUT A CIRCLE ROUND 58 WORDS ON THIS YELLOW QUESTIONNAIRE.

## SURVEY OF HEALTH BEHAVIOUR

The purpose of this survey is to find out what you think and feel about things which may affect your health. It is not a test, so there are no 'right' or 'wrong' answers. It is made up of what has been said by young people in several different schools.

We would like to have your honest opinions. We are not asking you to put your name on this questionnaire, so nobody will know how you have answered.

For Office Use.

Please fill in the following:

.....1-3

Date: \_\_\_\_\_ Name of School: \_\_\_\_\_

.....4-5

Your Age: \_\_\_\_\_

.....6-7

Boy/Girl? \_\_\_\_\_

.....8

### Practice Questions.

Do you think you will clean your teeth carefully before going to bed tonight?

definitely no - perhaps - quite likely - definitely yes

The answer we have chosen is 'quite likely', so we have drawn a circle round it. If we were absolutely sure we were going to clean our teeth carefully tonight we would have drawn a circle round 'definitely yes', and so on.

Now try the next ones for yourself.

Cleaning teeth prevents tooth decay

strongly disagree - disagree - not sure - agree - strongly agree

How important is it to you to prevent tooth decay?

not at all important - not very important - quite important - extremely important

Each of the items in this survey is similar to these practice ones. Read each one carefully, think about it, decide which one answer suits you best and put a circle round it, using a blue or black pen.

Comparison of means and standard deviations of computed variables from the main survey with those from the reliability study

Computed Variable	Main Survey		Reliability Study 1		Reliability Study 2	
	M	SD	M	SD	M	SD
AI	3.69	2.43	2.85	1.91	2.76	2.00
Sum AB	-15.78	16.57	-19.56	14.29	-22.27	14.80
ASP	13.64	9.00	20.00	7.68	12.03	7.40
SI	1.42	2.64	1.22	2.54	1.22	2.41
Sum SB	-18.27	10.24	-21.19	12.20	-18.83	10.34
SSP	5.59	7.20	5.14	8.11	5.08	7.33
KI	5.45	1.92	6.03	2.21	7.00	2.03
Sum KB	10.43	8.83	11.75	8.48	10.49	9.15
KSP	15.51	8.63	20.65	10.51	19.46	9.95
DPI	2.53	0.66	2.70	0.46	2.65	0.54
Sum DPB	7.51	4.34	7.75	4.04	7.84	3.95
DPSP	4.44	2.23	4.49	2.18	4.08	1.83
DFI	1.64	1.08	1.70	1.13	1.78	1.00
Sum DFB	2.77	5.24	2.09	5.62	1.41	5.76
DFSP	3.32	2.38	3.76	2.30	3.28	2.24
DSI	1.25	1.07	1.19	1.02	1.19	1.08
Sum DSB	-1.92	4.00	-2.48	3.91	-2.54	4.08
DSSP	1.44	1.57	1.22	1.53	1.53	1.59
DGI	6.13	1.89	6.39	2.06	6.68	1.96
Sum DGB	16.90	9.34	17.67	10.75	18.11	10.16
DGS	12.06	6.22	12.97	6.28	12.09	5.94
DWI	3.27	1.75	3.38	1.64	3.39	1.60
Sum DWB	-2.87	4.06	-3.56	2.93	-3.57	4.14
DWS	2.92	3.30	2.32	2.33	3.06	2.48
DAI	6.02	1.92	6.30	1.88	6.30	2.03
Sum DAB	6.80	6.94	6.89	6.26	5.67	5.36
DAS	7.30	4.64	6.38	3.75	6.69	3.96

## **SURVEY OF HEALTH BEHAVIOUR: INTENTIONS.**

The purpose of this survey is to find out about your intentions concerning:

- 1) drinking alcohol;
- 2) smoking cigarettes;
- 3) keeping fit;
- 4) what you eat.

It is not a test so there are no 'right' or 'wrong' answers. Try to answer as honestly as possible.

Please fill in the following:

Name or code

Date:                      Name of School:

Your Age:

Boy/Girl?

### Practice Question.

Do you think you will clean your teeth carefully before going to bed tonight?

definitely no - perhaps - quite likely - definitely yes

The answer we have chosen is 'quite likely', so we have drawn a circle round it. If we were absolutely sure we were going to clean our teeth carefully tonight we would have drawn a circle round 'definitely yes', and so on.

Now please complete the questions on the attached pages.

During the next month, I think I will drink alcoholic drinks:

- 1) at home with my family,  
definitely no - perhaps - quite likely - definitely yes
- 2) at the homes of friends or relatives,  
definitely no - perhaps - quite likely - definitely yes
- 3) with my friends in pubs or clubs.  
definitely no - perhaps - quite likely - definitely yes

\* \* \* \* \*

During the next month, I think I will smoke cigarettes:

- 1) when I am alone,  
definitely no - perhaps - quite likely - definitely yes
- 2) when I am with friends,  
definitely no - perhaps - quite likely - definitely yes
- 3) at a party or disco.  
definitely no - perhaps - quite likely - definitely yes

\* \* \* \* \*

In the next week I think I will:

- 1) do physical exercises which I can do alone, like jogging, aerobics, swimming, bicycle-riding, walking, etc.  
definitely no - perhaps - quite likely - definitely yes
- 2) take part in sports with other people outside school, such as squash, badminton, football, tennis, hockey.  
definitely no - perhaps - quite likely - definitely yes
- 3) avoid spending a lot of time just sitting around,  
definitely no - perhaps - quite likely - definitely yes

In the next few days I think I will eat:

- 1) Some **protein** (e.g. meat, fish, cheese, eggs, beans);  
definitely no - perhaps - quite likely - definitely yes
- 2) Some **brown wholemeal bread, bran or wholemeal cereal like muesli**;  
definitely no - perhaps - quite likely - definitely yes
- 3) Extra **salt** put on my food at the table;  
definitely no - perhaps - quite likely - definitely yes
- 4) Some **salad**;  
definitely no - perhaps - quite likely - definitely yes
- 5) Quite a lot of **sugar** (e.g. in tea or coffee, on cereals, in cakes, biscuits or puddings etc.);  
definitely no - perhaps - quite likely - definitely yes
- 6) Some **fresh fruit**;  
definitely no - perhaps - quite likely - definitely yes
- 7) Quite a lot of **crisps** or similar snacks;  
definitely no - perhaps - quite likely - definitely yes
- 8) Some fresh **green vegetables**;  
definitely no - perhaps - quite likely - definitely yes
- 9) Quite a lot of **fried foods** like chips, sausages, beef burgers, bacon etc.;  
definitely no - perhaps - quite likely - definitely yes
- 10) Quite a lot of **milk**, on its own and in other drinks (such as milk shakes, tea, coffee, drinking chocolate, etc.);  
definitely no - perhaps - quite likely - definitely yes
- 11) Quite a lot of **"sweets" or sweet snacks**.  
definitely no - perhaps - quite likely - definitely yes

# DIARY OF HEALTH BEHAVIOUR: DRINKING ALCOHOL

Your name or code: \_\_\_\_\_

Please put a tick in the appropriate date column when you drank alcohol in the following places: put a cross if you did not.

	WEEK1							WEEK2						
Month														
Date														
At home with the family.														
At the homes of friends or relatives.														
With friends in pubs or clubs.														

	WEEK3							WEEK4						
Month														
Date														
At home with the family.														
At the homes of friends or relatives.														
With friends in pubs or clubs.														

# DIARY OF HEALTH BEHAVIOUR: SMOKING

Your name or code: \_\_\_\_\_

Please put a tick in the appropriate date column when you smoked one or more cigarettes in the following places: put a cross if you did not smoke.

	WEEK1							WEEK2						
Month														
Date														
When you were alone.														
When you were with friends.														
When you were at a party or disco.														

	WEEK3							WEEK4						
Month														
Date														
When you were alone.														
When you were with friends.														
When you were at a party or disco.														



# DIARY OF HEALTH BEHAVIOUR: KEEPING FIT

Your name or code: \_\_\_\_\_

Please put a tick in the appropriate date column when you did the following things. Put a cross if you did not do any of these things.

	Month						
Date							
Doing physical exercises alone like jogging, aerobics, swimming, bicycle riding, walking etc..							
Taking part in sport with other people outside school such as squash, badminton, football, tennis, hockey etc..							
Avoiding spending a lot of time just sitting around.							

# DIARY OF HEALTH BEHAVIOUR: DIET

Your name or code: \_\_\_\_\_

Please put a tick in the appropriate date columns on when you ate the following kinds of food. Put a cross if you did not eat a particular kind of food.

	Month				
	Date				
Protein (e.g. meat, fish, cheese, eggs, beans);					
Brown wholemeal bread, bran or wholemeal cereal like muesli;					
Extra salt (put on food at the table);					
Salad;					
Sugar (e.g. in tea or coffee, on cereals, in cakes, biscuits or puddings etc.);					
Fresh fruit;					
Crisps or similar snacks;					
Fresh green vegetables;					
Fried foods like chips, sausages, beef burgers, bacon etc.;					
Milk, on its own and in other drinks (such as milk shakes, tea, coffee, drinking chocolate, etc.);					
"Sweets" or sweet snacks.					

**HEALTH BEHAVIOUR: PUPIL INTERVIEWS****(i) *Perceptions of frequency and quantity***

- a) Consider pupils responding "definitely yes" to "During the next month I think I will drink alcoholic drinks at home with the family". The range of behaviour responses which pupils considered properly corresponded to this intention varied from 4 ticks to 16 ticks. On interviewing the two pupils at the extremes of this range, both verified their behaviour. The pupil who had put 4 ticks said:

"...We always have wine with Sunday dinner so I answered definitely yes..."

The pupil responding with 16 ticks was 17 years of age, and regularly drank alcoholic drinks at home with his family.

- b) There was a great variation in the maximum scores for items 1, 2 and 3 in the Intention scales for both Alcohol and Smoking. For example, scores for item 3 of the Smoking scale tended to be lower than for items 1 and 2, because pupils go to discos and parties relatively infrequently.

- c) A girl put a cross in the diary every day against the item "avoiding spending a lot of time just sitting around". When she was questioned about this, it emerged that she had been quite active during the evenings and week-ends and had actually spent very little time "sitting around": at the most, she had watched T.V. for about an hour each evening. Other pupils with this level of "inactivity" had responded in their diaries with ticks.

d) Some pupils considered that half a pint of milk was 'a little' some thought it was 'a lot'.

e) The ticks in the Behaviour diary represented a wide range of quantities. One boy responded 'definitely no' to the Intention "I think I will eat quite a lot of sugar...". His Behaviour diary showed 4 ticks against this item. When asked about it he responded,

"When I was thinking ahead, I thought I wasn't having a lot. When I came to write it down, I realised I have two cups of tea with sugar each day, so I put a tick for each day.

In fact, these 4 ticks do *not* mean that the pupil is eating a lot of sugar: he has only two tea-spoonfuls a day so his Intention statement is fairly accurate, but his Behaviour Diary was misleading.

f) On interviewing pupils it emerged that one tick could represent 'a little' or 'a lot' of that particular food item, for example on item 1 of the Diet diary it could represent: a six ounce steak or 1/2 ounce of boiled ham in a sandwich; on item 5 of the Diet diary, a large dish of pudding or one teaspoonful of sugar; on item 9 of the Diet diary, a fried fish and chip meal or one sausage.

#### (ii) *Random occurrences*

a) The random nature of events influencing young peoples' behaviour in relation to their previously expressed Intentions is illustrated by the following quotations :

"...there was supposed to be a party but it never happened."

"...there was no family celebration during this time."

"...it depends on what goes on at home."

"...I didn't go to any discos or parties because I split up with my boy-friend."

b) Another example of the type of random occurrence cutting across stated intentions was the case of the pupil who had responded that he was only "quite likely" to do physical exercise alone, and whose Behaviour diary included 7 ticks in this category of physical activity. When questioned about this apparent discrepancy between actual and anticipated activity, he said "...that was unexpected. My Dad was on a different shift and went jogging in the evenings and I went with him. When he goes in the mornings I don't go."

c) A girl indicating that she would "perhaps" avoid spending a lot of time sitting around, completed her behaviour diary with 7 ticks for this item. She had obviously not spent a lot of time just sitting around and when questioned about this she said, "I didn't watch much telly this week. I had a lot of homework and was going out and that."

d) Another pupil, who indicated he was "quite likely" to take part in sport with other people outside school, had only 1 tick against this item in his diary. When asked about this discrepancy he said, "I didn't have much time because I did a lot of piano practice. I missed two weeks' lessons and I had to do a lot more practice

before the teacher came."

- e) One girl, responding "definitely yes" to items 1 and 2 on the Keeping Fit Intentions questionnaire, said that she went to the Sports Centre quite a lot. However, she had been on holiday when completing her diary and said "...there was nothing to do so we went to disco's every night...". No ticks appeared for items 1 and 2 in her diary. (One would assume disco dancing to be a rather energetic activity!)

(iii) ***A fleeting sense of permanence***

One boy said that at the time when he was completing the Intention scale he habitually never took part in sport with other people outside school. However during the week that he completed his diary (i.e. starting the very next day) his habits changed. He said, "I started playing football with my brother and his mates every night. I think I shall get into their team." He now seems to regard this evening activity as the new permanent state of affairs!

(iv) ***What is provided by others***

- a) Youngsters' drinking and smoking activities often depend on what is provided by parents, relatives and friends.

The following quotations illustrate this:

"...I smoked more than usual because I started going out with my (implied new) boy-friend who smokes."

"...my Dad was away during this time and we didn't have any wine."

"...I only have a drink when my parents offer it, I don't buy drinks"

"...I went on holiday with Jan's parents and I thought we should have some drinks but her Mom

and Dad wouldn't let us."

- b) The type of food pupils eat depends on what is provided, and can be attributed to various factors, in the pupils' own words:

"...when Mom did the shopping..."

"...what was left in the house at the end of the week..."

"...we don't have much cooked food when its hot..."

"...Mom didn't get any brown bread this week, she usually does..."

"...I didn't have any extra salt because Mom had put some in the cooking..."

"...fried food didn't turn up at home on these days, it usually does..."

"...we normally have salad at the weekend but we didn't this week end..."

"...my Mum must have been in a good mood, she bought sweets for my brothers and I had some. I don't buy them..."

"...I usually have chocolate biscuits at break but the tuck shop didn't have any so I had crisps..." "...I didn't have any green vegetables on these days because it was hot and we had salads..."

"...The weather was warm and we had barbecue and salads every night..."

"I usually have quite a bit of fruit, but Mom used what we had in a fruit salad and there wasn't any left..."

"...Mom bought more green vegetables than usual on those days..."

(v) ***Errors and misunderstandings***

- a) One pupil responded that he would be 'quite likely' to eat green vegetables, but his Behaviour diary had no ticks against this item. When he was questioned about this discrepancy he said, "My Mom had a craze on 'stir fry' vegetables this week, they aren't green are they?".

In fact, frozen stir fry vegetables usually contain green beans, peas, cauliflower, peppers and courgettes, together with various other vegetables. He was therefore eating green vegetables and his Intention was fulfilled.

- b) One sixth-form girl's diary showed that she had smoked on 3 occasions when she was alone, but her intention response to the corresponding item was "definitely no".

When questioned about this she said,

"...I don't know why I put ticks there, I must have put them in the wrong place. I never smoke when I am alone."

When questioned about discrepancies between Intentions and reported Behaviour, one girl said, "I didn't mean to put 'definitely no' there (i.e. as a response to the Intention question), I meant 'definitely yes'!"

- c) Another pupil who had responded 'definitely no' on item No.7 of the Diet Intention questionnaire said, "I must have made a mistake there, I usually have crisps every day."



**FACTOR ANALYSIS OF THE DATA FROM THE MAIN SURVEY**

The factors were defined by items with loadings greater than 0.5 and further detail to this definition was given by items loading between 0.3 and 0.5 (Child 1970, see Appendix 01 page A01.8). The definition of each factor will now be discussed.

***Factor 1: Social Pressure concerning diet and fitness***

Pupils experience a similar parental pressure towards eating all the foods specified (i.e. protein, fibre, salt, green vegetables and fruit, sweet foods and fatty foods) and also towards fitness. The absence of negative correlations indicates that pupils are not subjected to differential parental pressures with respect to foods that are 'good for them' and 'bad for them'. For example, they do not perceive encouragement to eat more fibre, green vegetables and fruit and less salt, sweet food and fatty food. This is worrying in the light of the NACNE Report (1983).

***Factor 2: Sweet and fatty foods***

Pupils seem to have similar perceptions towards sweet and fatty foods. This may be because they see them as 'bad for you' or, in the case of the girls in particular, as 'fattening'. On the other hand it may be because they enjoy eating them or see them as filling and giving energy.

***Factor 3: Drinking alcohol and smoking cigarettes***

Pupils have similar perceptions towards drinking alcohol and smoking cigarettes. This is hardly surprising since both alcohol and tobacco are socially accepted and legal drugs.

**Factor 4: Indulgencies**

Pupils have similar perceptions about Alcohol Intentions, Beliefs and Social Pressures and Beliefs about sweet food, fatty food and Smoking. These could be viewed as indulgencies perhaps but no clear message emerges from this factor.

**Factor 5: Salt**

Pupils Intentions, Beliefs and perceptions of Social Pressures concerning salt are independent of all other scales.

**Factor 6: Fibre**

Pupils see Intentions, Beliefs and Social Pressures concerning fibre as independent of all other scales.

**Factor 7: Diet and fitness**

Pupils have similar views towards foods that are 'good for them' (protein, fibre, green vegetables and fruit) and keeping fit. This indicates that they have perceptions of a healthy body achieved through 'correct' diet and physical exercise.

**Factor 8: Fitness**

Pupils perceive keeping fit to be closely associated with healthy foods (green vegetables, fruit, protein and fibre) but to correlate negatively with beliefs about sweet foods. So again physical fitness is related to healthy food as in Factor 7, but in addition sweet foods are seen to undermine fitness.